

Construction Economics and Management

MSc Report

**PRIVATE SECTOR PARTICIPATION IN ROAD  
INFRASTRUCTURE: A CORE COMPETENCIES APPROACH  
FOR GREEK CONTRACTORS AND CONSULTANTS**

by

**CHRISTOS KATHARIOS**

**This thesis is submitted in partial fulfillment of the requirements for the degree  
of Master of Science in Built Environment from the University of London**



Bartlett School of Graduate Studies

University College London

September 2005

**SUPERVISOR: GRAHAM IVE**

UMI Number: U594072

All rights reserved

INFORMATION TO ALL USERS

The quality of this reproduction is dependent upon the quality of the copy submitted.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if material had to be removed, a note will indicate the deletion.



UMI U594072

Published by ProQuest LLC 2013. Copyright in the Dissertation held by the Author.  
Microform Edition © ProQuest LLC.

All rights reserved. This work is protected against  
unauthorized copying under Title 17, United States Code.



ProQuest LLC  
789 East Eisenhower Parkway  
P.O. Box 1346  
Ann Arbor, MI 48106-1346

## ABSTRACT

**BOT** and **PPP/PFI** projects are increasingly gaining the trust of governments globally. Public sector has realized that only with the participation of **private financing** the required **infrastructure** can get constructed. Thus, the implementation of these projects represents both an opportunity and a challenge for both the public and the private sector. Particularly in relation to the Greek construction reality, there is very limited experience in these projects. However, there is the political will to promote such projects in the near future.

The objective of this research is to explore the topic of **core competencies** that members of the **construction industry** need to possess in order to participate successfully in **BOT** and **PPP/PFI** projects. The research, will especially focus on **Greek consultants** and **contractors** and examine their awareness and understanding of the specific issues related with these projects. For this reason, a number of leading consultants and contractors were approached in order to investigate their intentions and expectations about these projects and also assess their degree of preparation in terms of core competencies required. The acquired data were used in assessing the current state of the Greek construction industry in relation to the implementation of BOT and PPP/PFI projects in the near future.

Hopefully, this report could be supplemented by a similar one in the near future after the first series of such projects will have gone through and examine their degree of success or failure in relation to the current expectations and intentions of the Greek construction industry.

**Key words:** private sector participation, road concessions, BOT – PPP/PFI, Greek construction market, consultants, contractors, core competencies.

**Word count:** 10,975 (main text)

## **ACKNOWLEDGEMENTS**

I wish to express my gratitude to the following people who have contributed to the completion of this report:

- Graham Ive for his guidance, expertise, directions and cooperation.
- My interviewees for giving me the opportunity to perform this research and sharing their experience and views with me.
- Finally, above all, I would like to thank my family for their support throughout this year in London.

# TABLE OF CONTENTS

<b>CHAPTER 1: INTRODUCTION</b>	<b>1</b>
<b>CHAPTER 2: PRIVATE FINANCE IN INFRASTRUCTURE</b>	<b>3</b>
2.1. Concession	3
2.2. Risks	6
2.3. Procurement of BOT projects	9
2.4. Incentive contracts	10
2.5. Life cycle cost	13
<b>CHAPTER 3: GREEK CONSTRUCTION INDUSTRY</b>	<b>15</b>
3.1. Past - Present	15
3.2. Concession Projects in Greece	18
<b>CHAPTER 4: COMPETENCIES</b>	<b>22</b>
4.1. Construction competencies	28
4.2. Consultants - perspective	29
4.2.1. Core competencies for consultants	32
4.2.2. UK - consultants	33
4.3. Contractors - perspective	34
4.3.1. Core competencies for contractors	36
<b>CHAPTER 5: RESEARCH METHODOLOGY - ANALYSIS</b>	<b>38</b>
5.1. Scope of interviews – formation of questions	40
5.2. Outcome of interviews	48
5.2.1. Consultants	48
5.2.2. Contractors	52
<b>CHAPTER 6: CONCLUSIONS &amp; RECOMMENDATIONS</b>	<b>56</b>
6.1. Report overview	56
6.2. Key learning points	57
6.3. Conclusions - recommendations	58

<b><i>BIBLIOGRAPHY</i></b> .....	60
<b><i>APPENDIX A</i></b> .....	64
<b><i>APPENDIX B</i></b> .....	84

## LIST OF FIGURES

<i>Figure 1: European Motorways</i> .....	5
<i>Figure 2: Road life cycle</i> .....	13
<i>Figure 3: Analysing Strategic capability of an Organization</i> .....	24
<i>Figure 4: The relation of benchmarking, understanding and performance</i> .....	25

## LIST OF TABLES

<i>Table 1: Concession or no-concession practice in Europe</i> .....	4
<i>Table 2: Comparison of concession and traditional procurement</i> .....	4
<i>Table 3: Comparison of tolls and shadow tolls</i> .....	5
<i>Table 4: Construction – Operation Risks</i> .....	6
<i>Table 5: Risk allocation in road concession contracts</i> .....	8
<i>Table 6: BOOT road project components</i> .....	10
<i>Table 7: Management actions in support of the introduction of incentive during the tendering process</i> .....	12
<i>Table 8: Greek construction firms</i> .....	16
<i>Table 9: Financial Status of 7<sup>th</sup> class construction firms</i> .....	16
<i>Table 10: Financial status of the leading Greek consultants</i> .....	17
<i>Table 11: Past Concession projects in Greece</i> .....	19
<i>Table 12: New concession projects in Greece</i> .....	21
<i>Table 13: Core competencies acquisition agenda</i> .....	26
<i>Table 14: Designer – Contractor competencies</i> .....	28
<i>Table 15: Size and capacity of the consultants interviewed</i> .....	39
<i>Table 16: Financial data for the contractors interviewed</i> .....	40
<i>Table 17: Interviewees data</i> .....	40
<i>Table 18: Questionnaires data</i> .....	41
<i>Table 19: Key learning points – Consultants</i> .....	57
<i>Table 20: Key learning points - Contractors</i> .....	58

**LIST OF APPENDICES**

*Appendix A: Consultants - contractors questionnaire and tape-recorded interviews.....62*

*Appendix B: British consultants.....71*

**KEY ABBREVIATIONS**

- BO(O)T: Build Operate Transfer*
- DBFO: Design Build Finance Operate*
- GDP: Gross Domestic Product*
- PFI: Private Finance Initiative*
- PPP: Public Private Partnership*
- SWOT: Strength Weakness Opportunities Threats*
- SPV: Special Purpose Vehicle*
- FM: Facilities Management*
- Principal: the Public Sector client*
- Promoter: the SPV or the concession company*



## CHAPTER 1 – INTRODUCTION

It is common knowledge that a critical and inhibitory factor for the development of transport infrastructure is the lack of public funds, especially for countries with financial difficulties (Kaltsounis, 2004). However, the necessity of improving and developing transport infrastructure as a vital element for the creation of a competitive economy has led governments globally into practising with new forms of financing.

The existence of a complete highways network (well maintained and with sufficient capacity) is vital for the economic prosperity and progress of a country. The scale of the infrastructure required, the lack of adequate public financing and the need to reduce public sector borrowing has lead many countries towards the participation of the private sector in infrastructure. Within this framework, concession practices in Europe, but also globally have developed as means of improving and developing transport and especially road infrastructure.

In Greece we are currently experiencing a major shift in infrastructure procurement from the traditional way towards the implementation of BOT and PPP/PFI schemes. Within this framework both the opportunity and the challenge for the Greek construction industry is vast. Greek consultants and contractors are facing a major change in their work in terms of the required expertise and corporate culture. The challenge is even bigger for the public sector that traditionally is less efficient and effective in comparison with the private sector.

Within this framework the purpose of this research is to identify the specific issues related with BOT and PPP/PFI projects and especially transport projects in terms of the core competencies needed for the firms involved in such projects. Throughout an extensive literature review various issues such as the risks involved, the characteristics of concessions, the issues of innovation and buildability and of course the implementation of life cycle cost were identified. Moreover, a brief presentation of the current situation of Greek contractors and the past concession projects constructed is conducted.

A review of the appropriate literature on core competencies and especially competencies for contractors and consultants takes place in the next chapter. The scope is to identify the specific resources and assets (tangible or intangible) that a technical firm (contractor or consultant) must possess in order to be able to match the specific requirements of these projects and be competitive. Non technical resources and skills such as culture are also addressed.

The main part of this report is the assessment of the alertness and preparation of Greek consultants and contractors for the specific issues involved in BOT and PPP/PFI projects. In order to do so, a number of questions that were stimulated from the issues identified in the literature review were used to conduct a series of interviews with members of the Greek construction industry. These semi structured interviews with members of some of the leading Greek consultants and contractors had the scope of assessing the current status and future expectations of these firms in relation to BOT and PPP/PFI projects. Moreover, the questions asked, aimed at probing whether the firms are aware of the core competencies required for these projects and either already possess them or are in the process of acquiring or developing them. This is very important if Greek firms are determined and focused on changing their culture and deal with BOT and PPP/PFI projects as core and not as just means of increasing turnover. In addition, Greek construction industry has to become more competitive as these projects prevail globally and competition by foreign firms will be very intense.

Finally, the outcome of these interviews in relation to the international experience in these projects is presented and criticised. British experience and similar research attempts are used in order to assess the awareness of Greek firms of the specific problematic issues involved with these projects and examine whether they are prepared to deal with them. Conclusions, key learning points and directions for further research are given at the last chapter of this report.

## **CHAPTER 2 – PRIVATE FINANCE IN TRANSPORT INFRASTRUCTURE**

Governments throughout the world are facing the challenge of delivering their objectives by using their resources in the most efficient way. In addition, private sector is generally considered to possess skills and strengths that are not found in the public sector. It is common belief that the private sector knows how to act commercially and understands better the needs and challenges of the market. Thus, it would be more efficient for a government to harness those abilities of the private sector in order to deliver its objectives. Following these findings the role of the state has changed from that of a provider of services to that of an enabler and regulator for the private provision of services (Haynes and Roden, 1999).

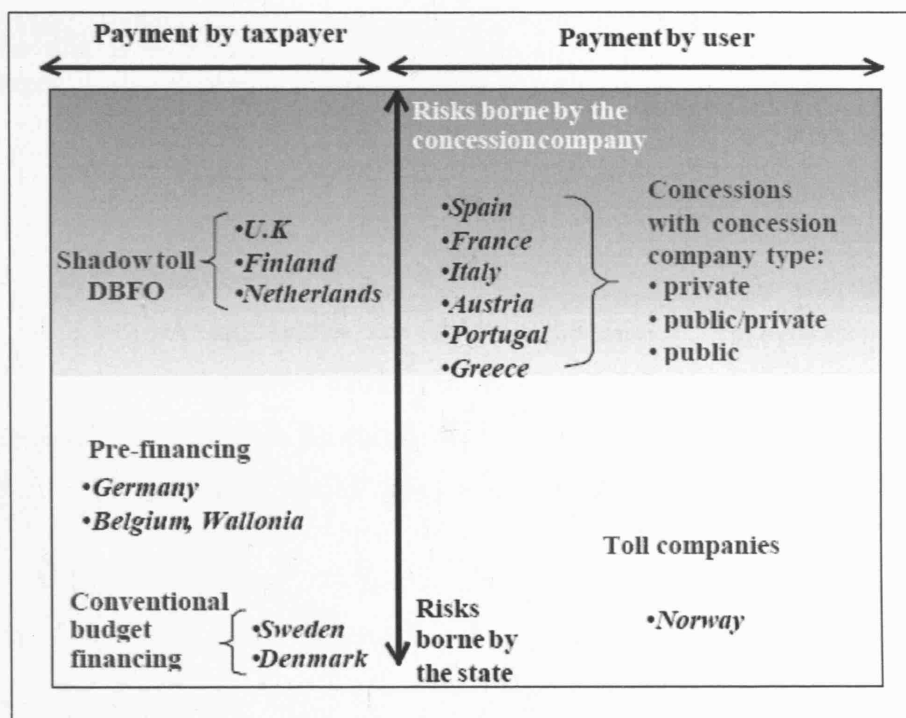
### **2.1. Concession**

A concession is identified as a system by which the public grants specific rights to an organization to construct, maintain and operate an infrastructure for a given period of time. In road infrastructure concession practice<sup>1</sup> there can be identified two distinctive methods. Direct payment or user charge is used widely in Europe in countries such as Austria, Denmark, Spain, France, Greece, Italy, Norway and Portugal. On the other hand payment by the public authority in the form of shadow tolls<sup>2</sup> is the method used in a group of other European countries such as UK, Finland and the Netherlands (Table 1). Moreover, the basis of the European Commission's charging policy is the 'user-pays' and 'polluter-pays' principle, which means that the external costs, e.g. the costs of congestion, accident and damage to the environment should be internalised.

---

<sup>1</sup> Other authors, (Ive, 2004), make a clear distinction between concession and PFI contracts. However, in this report concession will be used in a wider sense involving both types of contracts either direct or shadow tolls.

<sup>2</sup> The public authority remunerates the concession company based on the degree of utilization of the infrastructure.

**Table 1: Concession or no-concession practice in Europe**

Source: Bousquet and Fayard (2001)

The differences between concession and traditional procurement can be seen in Table 2. It is obvious that within a concession the concessionaire bears the cost of the investment and a significant part of the total risk of the project. Table 3 depicts the advantages and disadvantages of the types of concession.

**Table 2: Comparison of concession and traditional procurement**

Concession	Work Contract
Multi-purpose: responsible for construction programme and provision of long-term service	Single objective: construction
Duration: long (mean=30years)	Duration: short
Funding: concession company	Funding: no interim funding, co-funding or funding of infrastructure by contractor
Concession company investment	No investment by contractor
Long-term occupation of public domain	No-long term occupation of public domain
Freedom concerning infrastructure design	No freedom in design of infrastructure

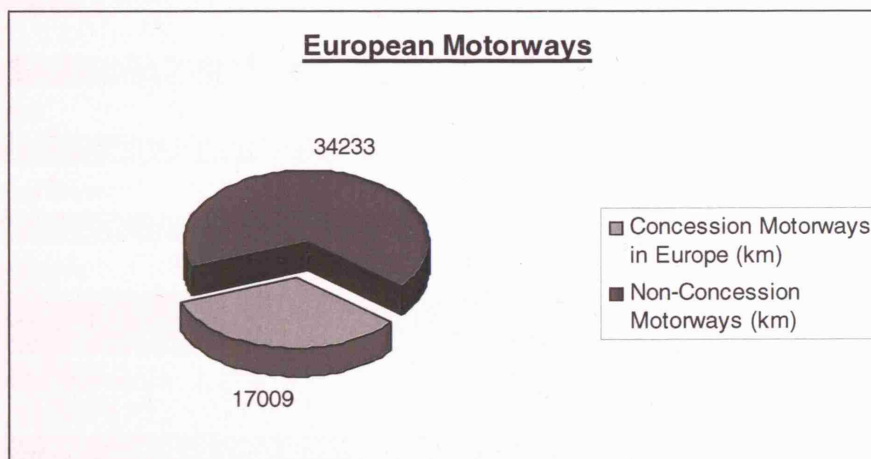
Source: Bousquet and Fayard (2001)

**Table 3: Comparison of tolls and shadow tolls**

	<b>Toll Concessions</b>	<b>Shadow Tolls</b>
<b>Advantages</b>	Replacing taxpayer money with user money Application of the user-payer principle Arbitration between maintenance and investment A toll system can serve to optimise utilization of transport network	No tendency to shift traffic into other roads No expenses associated with toll collection The main advantages of a toll system are maintained
<b>Disadvantages</b>	Problems of social acceptability Reduced socio-economic return for the project (users are not willing to pay) Additional costs related to the construction, maintenance and operation of toll collection facilities	Does not solve the funding problem The cost is borne by the taxpayer not the user High financial and legal costs

Source: Bousquet and Fayard (2001)

The current situation regarding concessions in Europe can be seen in Figure 1. Out of the total 17,009 km of concessions in Europe, 16,356 km are toll roads and 653 km are shadow toll roads.

**Figure 1: European Motorways**

Source: Bousquet and Fayard (2001)

In regards to DBFO roads it can be said that compared to traditional procurement (budgetary financing) savings of the order of 20-30% were noted (Heggie, 1999).

Design freedom, transfer of risks and management by the concessionaire are major advantages compared to traditional work contracts. The key components of a road concession can be identified as the following (Bousquet and Fayard, 2001):

- Lot size
- Concession period
- Toll charges
- Concession award criteria
- Potential for development of new ideas by the concession company
- Sharing of risks between the concession authority and the concessionaire

## 2.2. Risks

The risks involved in a BOOT project can be categorised according to the two distinctive phases of the project: construction and operation (Table 4).

**Table 4: Construction – Operation Risks**

### **Construction Phase**

#### **Risks**

Completion delays

Cost overruns

Force majeure

Political risk

#### **Solution**

Experienced turnkey contractor, penalties, performance bonus, guarantees, proven technology

Fixed-price contracts, standby credit, increased equity

Insurance, government indemnities

Insurance

### **Operation Phase**

#### **Risks**

Revenue stream

Performance/Technical

Operation/Maintenance

Foreign exchange<sup>3</sup>

#### **Solution**

Market study/traffic growth

Proven technology, performance guarantees, contractor's equity

Contractor involvement, experienced contractor

Flexible price formula, central bank assurances, swaps

Source: Walker and Smith (1997)

<sup>3</sup> It must be noted that within Euro zone this risk is not valid anymore due to the use and global acceptance of euro.

Although the scope of the government in both BOOT and PFI projects is first to transfer as many risks as possible to the private sector and second to receive value for money, the irrational transfer of risks to the private sector will not achieve those objectives. The basic principle would be to transfer those risks that the private sector is more able to understand and handle than the public sector. In general in road projects the following risks are usually transferred to the private sector (Walker and Smith, 1997):

- ❖ Design risk
- ❖ Construction risk
- ❖ Operation risk
- ❖ Interest rate risk<sup>4</sup>

On the other hand, the government is expected to retain the following risks:

- Land procurement and planning permission risk
- General inflation risk<sup>5</sup>
- Residual value risk
- Regulatory risk

Another attempt to categorize risks is to separate them into two major categories general/country risks and specific project risks. The first category includes the political, commercial and legal risks and the second the developmental, construction/completion and operating risks (Thomas et al., 2003).

Many transportation projects failed due to overoptimistic traffic forecasts and excessive debt, and as they went bankrupt they had to be renegotiated or taken over by the government (Thomas et al., 2003). A detailed risk allocation strategy in the case of road concession (with shadow tolls) contract can be seen in Table 5.

---

<sup>4</sup> Examining the UK DBFO experience it can be noticed that debt refinancing can reduce the impact of this risk.

<sup>5</sup> Normally in the concession contract there will be embedded a formula that adjusts toll rates in accordance to the inflation rate. However, it must be noted that there are two rates of inflation the rate of the specific country that affects those values that have to do with domestic operations and the Euro zone rate that affects debt repayment.

**Table 5: Risk allocation in road concession contracts**

<b>Risks</b>	<b>Public</b>	<b>Private</b>	<b>Shared</b>
Design & Construction		Borne by the concessionaire, who undertakes detailed design	
Latent Defects		Defects that arise in the 30 year contract lie with the operator	
Delivery / Timing		Shadow toll payments start when service is delivered	
Planning	The first tranche of DBFO projects had already passed statutory planning as public sector projects		
Volume			The traffic bands system sets downside risk with private sector and upside risk with the Agency
Operation & Maintenance		Private sector responsible for operation and planning	
Protester action			Varies between projects
Force majeure			Mostly with the public sector
Indemnity/Insurance		It lies with the operator. Only cost risks are insurable not loss of revenues	
Legislative		Risk of law changes lies with the operator, except the ones that discriminate against operators or DBFO roads	

Thomas et al. (2003)

According to surveys the ten most important risks would be: design risk, construction cost risk, performance risk, risk of delay, cost overrun, commissioning risk, volume risk, operating/maintenance risk, payment risks and tendering cost risk (Thomas et al., 2003). Less important risks would be land acquisition, debt risk, bankers' risk and political risks.



The perception and attitude of contractors towards the risks involved in a BOT project can be summarized as the following (Walker and Smith, 1997):

- High tendering cost
- Lack of exclusivity
- Expected return
- Long-term equity interest
- Government's commitment

### **2.3. Procurement of BOT projects**

BOT projects can be invited tender by the Principal or by speculative bid by a Promoter. In the case of an invited tender many elements of risk will be defined by the terms of invitation while in a speculative bid this will be achieved through negotiation between the Promoter and the Principal regarding their obligations. Globally 60% of BOT projects are the result of speculative tendering. This percentage within the EU is much lower due to the need to create competition before awarding a bid.

Speculative bids: in such a bid a Promoter approaches a principal with a proposed scheme considered commercially viable by the Promoter (Mullinger and Grimsey, 1996). The Promoter requests that the Principal grants a concession for a defined period of time before transferring the facility to the Principal.

Invited Bids: in such a bid the Principal invites a number of Promoters to bid for the privilege of being granted a concession. In the case of transport projects the government usually defines the corridor but the private sector is required to select the detailed route, acquire the land, design – build - own and operate the project on the basis of a time-limited concession.

Existing facilities: In many cases existing facilities are utilised in concessions as sources of revenues for the Promoters in order to guarantee an immediate income which may reduce loans and repay lenders and investors early on in the project life.

The components of a BOT road project can be categorised in four packages as seen at Table 6 below.

**Table 6: BOT road project components**

<b>Construction Package</b>	<b>Operation package</b>	<b>Finance package</b>	<b>Revenue package</b>
Feasibility studies	Operation	Debt finance loan	Demand data
Site investigation	Maintenance	Equity finance	Toll or tariff levels
Design	Training	Long term or short term loan facilities	Assignment of revenues
Construction	Off take	Standby loan agreements	Toll or tariff structures
Supervision	Supply	Currency contracts	Sales agreements
Land purchase	Transfer	Debt service arrangements	Revenues from associated developments
Commissioning	Consumable		
Procurement	Insurance		
Insurance	Guarantees		
Legal contracts	Warranties		
	Licences		
	Power contracts		

*Source: Merna and Smith (1996)*

## 2.4. Incentive contracts

The implementation of an incentivisation scheme can be an effective way of ensuring that the desired outcome in terms of time, cost and quality will be achieved. The importance of introduction of performance measurement is emphasized also in the Egan Report (1998). The purpose of an incentive contract is to align the objectives of the client and the contractor through the use of suitable performance measures and linking them to payment<sup>6</sup>. Innovation offers the opportunity for bidders to strive to reduce the cost of providing a specific service by designing a facility that offers the

<sup>6</sup> However, the performance objectives should be realistic and achievable otherwise the contract will probably fail no matter how attractive the incentives are.

most efficient combination of construction, operating and maintenance costs (CIC, 1998).

Construction performance is measured by reference to time, cost and quality. Thus, better performance will mean:

- ❖ Beat the completion date
- ❖ Beat the construction price
- ❖ Beat the quality requirements
- ❖ Improve safety and environmental requirements

Better performance can be achieved only if each party can manage better the risks associated with the project. The difficulty is to align the objectives of the client, the contractor and the consultant and maintain their compatibility. A brief outline of the necessary actions and their sequence can be seen in Table 7.

In regards to roads the following performance indicators can be identified:

- ❖ Maintaining roads and footways
- ❖ Maintaining street lighting
- ❖ Emergency call-outs
- ❖ Winter maintenance services
- ❖ Management of road works
- ❖ Requests for services

**Table 7: Management actions in support of the introduction of incentives during the tendering process**

<b>Action</b>	<b>Activity</b>
1	Define the risks
2	Agree level of risk transfer
3	Make a joint presentation to all tenderers
4	Provide tenderers with as much information as possible
5	Encourage tenderers to open a dialogue with the project design team on a confidential basis
6	Ask tenderers to highlight any anomalies within the tender documents
7	Encourage alternative designs
8	Lengthen the tender period if necessary
9	Develop a better understanding of the tenderers view of the construction period and payment mechanisms

*Source: CIRIA (2001)*

In a concession contract one of the most important factors of consideration is the output specifications, meaning what the client wants and how it is going to be achieved. There are four distinctive elements to an output specification (Winch, 2000):

- ❖ Objectives which locate the project within the overall strategy of the client and specify the service to be delivered
- ❖ Purpose which specifies the outputs to be achieved by the facility
- ❖ Scope which specifies the core requirements of the service and any additional desirable services
- ❖ Performance specifies the level of service to be delivered in terms of measurable criteria

Incentive contracts have the effect of moving the construction industry towards innovation. Innovation can be identified as the result of an expenditure successfully incurred in the uncertain hope of developing new, non-routine problem solutions. In

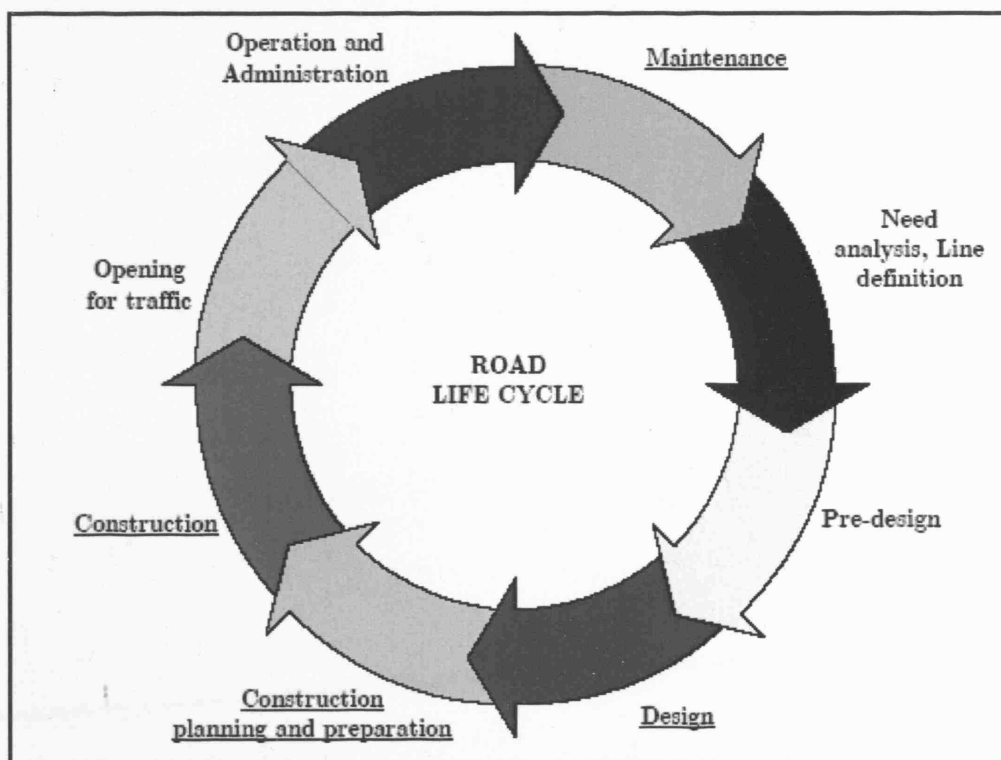
order for it to be successful the means, motive and opportunity are required to coexist (Ive, 1995).

## 2.5. Life cycle cost

The fundamental idea behind whole life costing is that investment in the quality of the specification now, can obtain returns later in lower operating costs and less frequent repair and maintenance of the facility (Winch, 2000). One of the advantages of concession contracts is that it generates incentives for the concessionaire to consider the costs throughout the whole life cycle of the facility.

The life cycle of a road can be seen in Figure 2. Innovative design and operation can assist in reducing the total life cycle cost of the infrastructure. Practice has showed that the use of innovative materials and techniques in road construction can result in reduced thickness up to 30% with additional improved performance and ease of maintenance compared to the standard road design (Baxter, 1997).

Figure 2: Road life cycle



Source: Jurasz (2003)

The construction/maintenance of roads involves the following operations (Source: Jurasz, 2003):

- ❖ construction of bridges and tunnels (new roads),
- ❖ earthmoving (new roads):
- ❖ cut and fill operations,
- ❖ spreading of the aggregates,
- ❖ levelling and compaction of the earthworks surface.
- ❖ milling and recycling (especially in maintenance phase),
- ❖ laying (building-in) of the pavement layers.

Innovation can be applied in some of the above operations and actions of the life cycle of a road segment in order to construct a more cost efficient road with lower maintenance and operation costs. The consultant's role in implementing innovation in road construction is crucial especially in PFI projects where one of the main objectives is to minimize the whole life cycle cost and not only the construction cost.

## **CHAPTER 3 – GREEK CONSTRUCTION INDUSTRY**

### **3.1. Past - Present**

Greek construction industry in the period of 1999-2004 sustained a number of changes in order to remain competitive and meet the new challenges. Within this framework a number of mergers and acquisitions took place so as to create construction groups capable of dealing with the new highly-technical and demanding projects. Moreover, the companies of the industry had to focus also on facilities management (FM), infrastructure operation and project financing capabilities. The total value added of construction industry is predicted to be around 5% of the GDP for the time period 2003-2006 provided that the funds from the EU will be utilised.

The current status of the industry, the one shaped after the needs of the Olympic Games, can be seen in Table 8. It is obvious that the firms having obtained a public works certificate of 7<sup>th</sup> class are the most capable of dealing with concession projects. A general observation that can be made is that companies that traditionally dealt only with construction works are now transformed into larger and more diversified corporations where service provision is a major area of involvement. However, private sector firms are still reluctant to enter concession projects mostly because of their lack of expertise and experience, a phenomenon that is even more amplified by the delay and inability of the public sector in setting the necessary framework that will govern such projects (Giannaros, 2005).

**Table 8: Greek Construction Firms**

<b>Public Works Certificate</b>	<b>Total Turnover (all firms million €)</b>	<b>Number of Firms</b>	<b>Average Turnover (per firm million €)</b>	<b>% of total Turnover</b>
7 <sup>th</sup> class <sup>7</sup>	2,810	14	201	59
6 <sup>th</sup> class	890	51	17	19
5 <sup>th</sup> class	520	65	9	11
4 <sup>th</sup> class	303	85	3	7
3 <sup>rd</sup> class	240	173	1	4

*Source: Giannaros (2005)*

The following table (Table 9) depicts the financial situation of the groups in 7<sup>th</sup> class. What is of great importance is the *net current assets* or *net working capital* value that roughly measures the company's potential reservoir of cash. The latter is very important when a company considers entering a highly risky business such as BOT and PFI projects. *Net working capital* = *current assets* – *current liabilities* (Brealy and Myers, 2003).

**Table 9: Financial Status of 7<sup>th</sup> Class Construction Firms**

	<b>Company Name</b>	<b>Total Turnover 2004 (million €)</b>	<b>Net Current Assets 2004 (million €)</b>
1	Aegek	140	110
2	Aktor	680	130
3	Alte	120	10
4	Athina <sup>8</sup>	190	30
5	Attikat	80	90
6	Bioter	100	20
7	Empedos <sup>9</sup>	180	30

<sup>7</sup> In order to comprehend the changes imposed to the industry by the new classification system it must be mentioned that the 14 groups of companies of the 7<sup>th</sup> class represent 109 firms of the previous classification system after the series of mergers and acquisitions.

<sup>8</sup> 2003 data.

<sup>9</sup> 2003 data.



8	<b>Efkliidis</b>	80	50
9	Gek – Terna	430	150
10	<b>J&amp;P – Avax</b>	480	50
11	Michaniki	150	180
12	<b>Moxlos</b>	410	30
13	Pantexninchi	170	40
14	<b>Themeliodomi<sup>10</sup></b>	180	50

*Source: firms' websites (2005)*

In addition to the cautious moves of the construction firms, the lenders (commercial banks) are also having reservations regarding their participation in concession works as they are not willing to accept the risks that these projects involve.

The next step in order to examine the preparation of the Greek private sector to enter BOT and PPP/PFI projects would be to assess the current situation of the leading Greek consulting firms. The financial status of the leading Greek consultants is given below at Table 10 by means of their total turnover and their number of employees in order to examine their size and capacity. It must be also stressed that these companies are the ones most heavily involved in international projects and joint ventures with foreign consultants. In other words, both their expertise and experience will enable them to undertake the vast amount of the BOT and PPP/PFI projects underway in Greece on their own or in joint ventures with international consultancies.

**Table 10: Financial status of the leading Greek consultants**

	<b>Company Name</b>	<b>Total Turnover 2002 (million €)</b>	<b>Number of Employees 2004</b>
1	Asprofos <sup>11</sup>	20	-
2	<b>Metrotech Group</b>	10	100
3	ADO	8	130
4	ADK	7	150

<sup>10</sup> 2003 data.

<sup>11</sup> It must be noted that the main shareholder of Asprofos is the Greek Government.

5	SGI – Trademco	5	50
6	Betaplan	5	50
7	LDK	5	100
8	Denco	5	100
9	Nama	4	80

*Source: firms' websites and Hellenic Association of Consulting Firms (2005)*

### 3.2. Concession Projects in Greece

Having stated the current situation in Greece regarding concession works it is very interesting to mention that Greece was one of the first countries to implement such practices in the past. The Korinthos canal, Athens light rail and the Marathonas dam were projects designed, financed and constructed by the private sector (Giannaros, 2005). In the most recent years there are only a few projects that fall into the concession practise (Table 11). Moreover, a number of private parking spaces have been recently constructed within the Athens region using a concession agreement. The projects mentioned have been successfully constructed and operated. However, the percentage of private sector equity funds has been heavily criticised in Greece as it is considered to be very low: below 13% in all projects<sup>12</sup>. More to the point, the percentage of commercial bank lending is very low. Moreover, criticism of the allocation of risks and of the unsuccessful transfer of risks to the private sector has taken place as it is obvious that the public sector retained a large number of the risks involved. However, the main points that can be made from this data and in comparison with more mature PPP/PFI markets, such as the UK, are that the participation of commercial banks debt is very low and that EU funding has an important role in the viability of the project. The latter, cannot be guaranteed to keep existing, which amplifies even more the necessity for the maturity of the BOT and PFI market in Greece and the proactive role the private sector should adopt in order for certain infrastructure projects to go through.

<sup>12</sup> However, even in more mature markets in terms of BOT and PFI equity is usually between 8-15%; i.e. in the same range as found in the Greek projects.

**Table 11: Past Concession Projects in Greece**

	<u>Athens Airport</u>	<u>Attica Ring Road</u>	<u>Rio-Antirrio Bridge</u>
Contract Type	PPP	BOT	BOT
<b>Total Cost</b> (million €)	2,220	1,240	740
Concession (years)	30	23	42
<b>Concessionaire</b>	8	13	10
<b>Equity Funds (%)</b>			
EU-public sector funds (%)	18	33	40
<b>Debt funds<sup>13</sup> (%)</b>	45	42	50
Debt funds <sup>14</sup> (%)	16	-	-
<b>Other (%)<sup>15</sup></b>	13	-	-
Commercial Banks Debt (%)	-	12	-
<b>IRR</b>	11.50	15.30	11.50

*Source: Giannaros (2005)*

In the above projects it must be noted that Greek contractors participated in joint ventures with global construction firms such as Hochtief for the airport and Vinci for the bridge. Moreover, well-known engineering consultant firms such as Halcrow<sup>16</sup>, Faber-Maunsell and Steer Davies Gleave<sup>17</sup> were involved in these projects. As a conclusion from these pioneering projects it can be said that both the public sector and the commercial banks did not exploit those opportunities in order to improve their efficiency and expertise. This conclusion is strengthened even more by the fact that a number of projects that were supposed to have been implemented since 2000 have not yet been put forward (Table 12). A final point regarding the criticism for these first BOT projects is that due to the absence of an appropriate legal framework, each

<sup>13</sup> Guaranteed by the Greek government.

<sup>14</sup> Guaranteed by the German Export Organization (Hermes).

<sup>15</sup> Specific tax imposed by the government for the construction of the new airport.

<sup>16</sup> Technical advisor to the lenders.

<sup>17</sup> Traffic Advisor for Motorway Concessions in Greece, client Hellenic Ministry for the Environment, Physical Planning and Public Works.

contract had to be approved by the Greek parliament, a factor that adds to the complexity and difficulty of these kinds of projects (Tsampoulas, 2003).

As it can be seen from the table above, Greek government's participation in the projects mentioned was not only in providing part of the funds but also as a guarantor for the debt funds of the concessionaire. In other words the element of risk transfer was not evident as the public sector retained a large number of both the construction and operation risks.

As a guidance rule for the future of such projects in Greece, it can be said that the public sector needs to acquire the necessary experience and expertise which is currently not present, a detailed and secure legal framework has to be created and the private sector in general has to be more willing to accept the commercial risks and a large number of the total risks (Tsampoulas, 2003).

According to the government's intentions, the maintenance and operation of a total number of 1,403 km of existing highways is going to be awarded to concessionaire companies, in order to construct a further 802 km of highways. The main issues of dispute and concern between the private and the public sector can be categorised in three main areas (Giannaros, 2005):

- Financial support by the public sector: in the projects that have been constructed the public sector had an important participation in the form of both funds and subsidy and vouching for the loans of the concessionaire.
- Allocation of risks: an important issue was the responsibility for the construction and operation within the necessary time frame of various supplementary projects (connection roads etc.) vital for the operation of the concession project.
- Various other issues: there were also disputes, stemming mainly from the inexperience of both parties and from the lack of a legal framework, such as the amount of user charges and the responsibilities and authorities of the public sector during the operation of the concession project.

**Table 12: New Concession Projects in Greece**

<u>Projects</u>	<u>Total Cost (million €)</u>
Maliakos-Kleidi	580
Salonica submerged tunnel	390
PATHE	2,200
Central Greece motorway	1,440
Korinthos-Tripolh-Kalamata	750
Ionia motorway	1,200

*Source: Giannaros (2005)*

According to a research conducted in the National Technical University of Athens Greece, domestic road users are willing to pay a toll of up to 60% of the benefits provided by a modern road (Kaltsounis, 2004). This is amplified even more by the fact that the quality and the condition of the existing road network are low compared to the situation in other European countries. An example strengthening this opinion is the fact that although at first the user charges imposed at the Attica ring road were considered as very high, the traffic volume observed at the first year of operation was more than the one forecasted. As a conclusion, it can be said that due to the lack of alternative routes or better quality of service routes, even a small improvement in a specific road segment is perceived as a major benefit and the users are willing to experience a greater cost in user charges<sup>18,19</sup>.

<sup>18</sup> In several motorway projects in Spain the high level of tolls has resulted in limited numbers of road users and in increased congestion on the minor roads as travellers seek to avoid paying tolls (Merna and Smith, 1996).

<sup>19</sup> Toll charges in Europe vary from €0.05/km in Italy to €0.02/km in Greece and average of €0.06/km in France and Spain. Generally heavy goods vehicle toll charges are two to three times higher than those for private cars (Bousquet and Fayard, 2001).

## CHAPTER 4 – COMPETENCIES

Analyzing the strategic capabilities of an organization is very important in terms of examining whether the resources and capabilities fit the environment in which the organization is operating and the opportunities and threats that exist (Johnson and Scholes<sup>20</sup>, 1999). A way of auditing the strategic capability of an organization can be seen in Figure 3. A resource audit identifies and classifies the resources that an organization owns or can access to support its strategies.

The main issue in understanding the strategic capability of an organization is an assessment of the competencies which exist to undertake the various separate activities of the business. However, it must be noted that competencies are difficult to assess in absolute terms so some basis of comparison is needed with the most common being historical (improvement or decline through time), industry norms (comparison with the performance of similar organizations, often competitors) and benchmarking (comparison of competencies with best practise) (Johnson and Scholes, 1999).

Resources are firm specific assets that are difficult to imitate because of transaction costs and tacit knowledge (De Haan et al., 2002). Typically resources can be grouped under the following categories:

- ❖ Physical resources
- ❖ Human resources
- ❖ Financial resources
- ❖ Intangibles

The difference in performance of different organizations in the same industry is rarely a matter of difference in their resources per se. Superior performance can be achieved by the way these resources are deployed to create competencies in order to sustain excellent performance (Johnson and Scholes, 1999). More important for the successful operation of an organization are core competencies<sup>20</sup>. The difficulty in possessing and

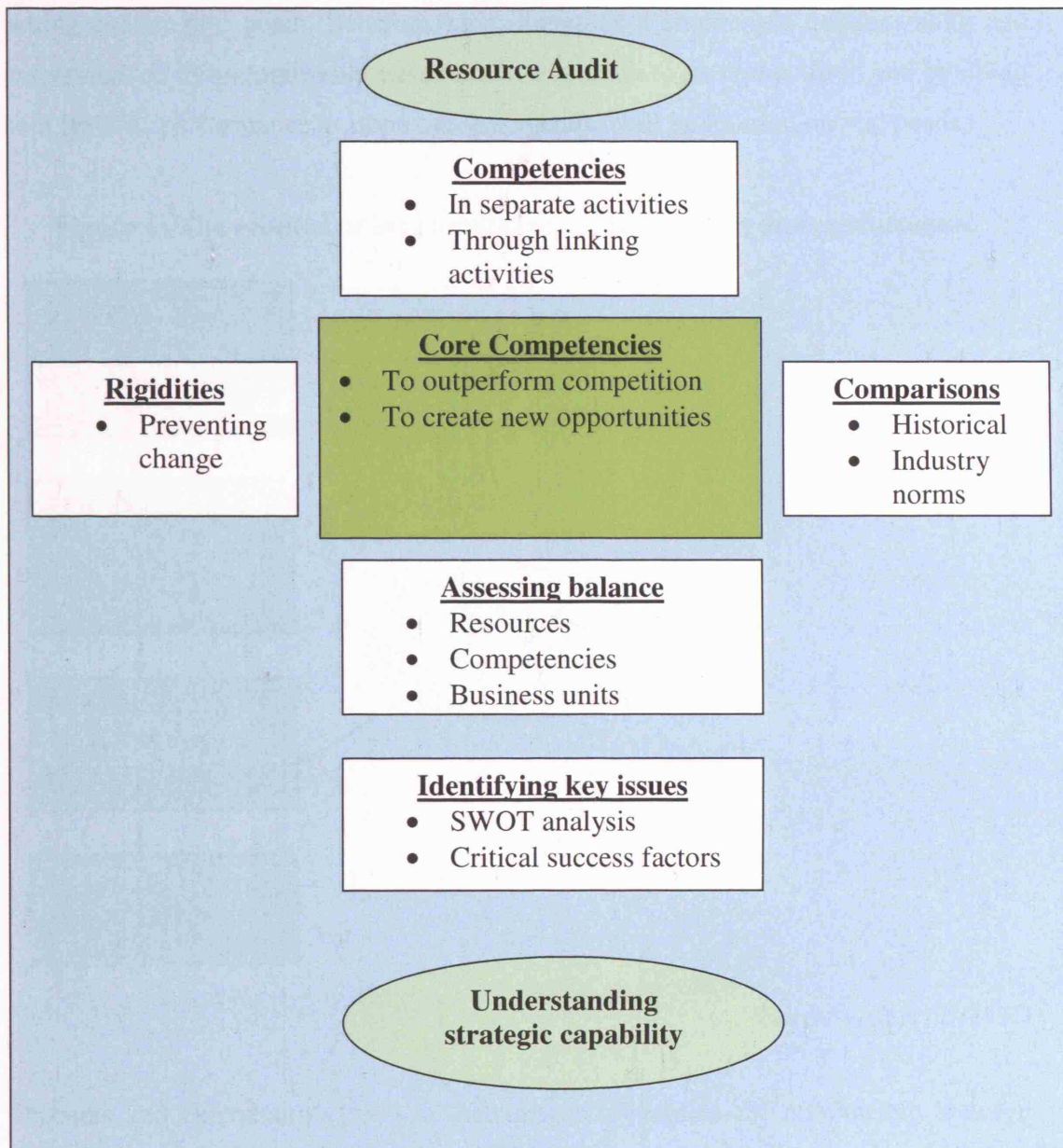
---

<sup>20</sup> Core competencies are those competencies which critically support and sustain the organization's competitive advantage (Johnson and Scholes, 1999).

exploiting such competencies is that they must not only provide value, but also be difficult for the competitors to imitate in order to achieve a sustainable competitive advantage. Thus, those competencies must be rare and complex or as embedded in the organization's culture as to be tacit (Johnson and Scholes, 1999). The bases on which an organization's core competences can be build can be categorised into four parts:

- Cost efficiency: is a measure of the resources needed in order to create a given level of value. Cost reductions and efficiency can be achieved through economies of scale, supply cost, experience and product/process design.
- Value added (Effectiveness): is a measure of the level of value which can be created by a given set of resources. Effectiveness can be assessed by examining the client's requirements and expectations and the degree of matching and satisfying them by the organization.
- Managing linkages: Managing linkages within the organization's value, supply and distribution chain provides leverage and levels of performance which are difficult to match. It can be categorised in internal and external linkage with the first examining the primary and support activities within the firm and the latter the co-ordination of the activities with suppliers and distributors.
- Robustness: examines the ease or difficulty of imitating the competencies of an organization. In addition it examines the specific nature and ownership of the organization's competencies.

It is important for an organization in order to form a competitive strategy to know its strengths and limitations. Moreover, having identified its resources and competencies and the opportunities in its business area, try to narrow them and match the opportunities with the organization's competencies. That way a company positions itself in its environment and minimizes weaknesses and maximizes strengths (Mintzberg, 1990).

**Figure 3: Analysing Strategic capability of an Organization**

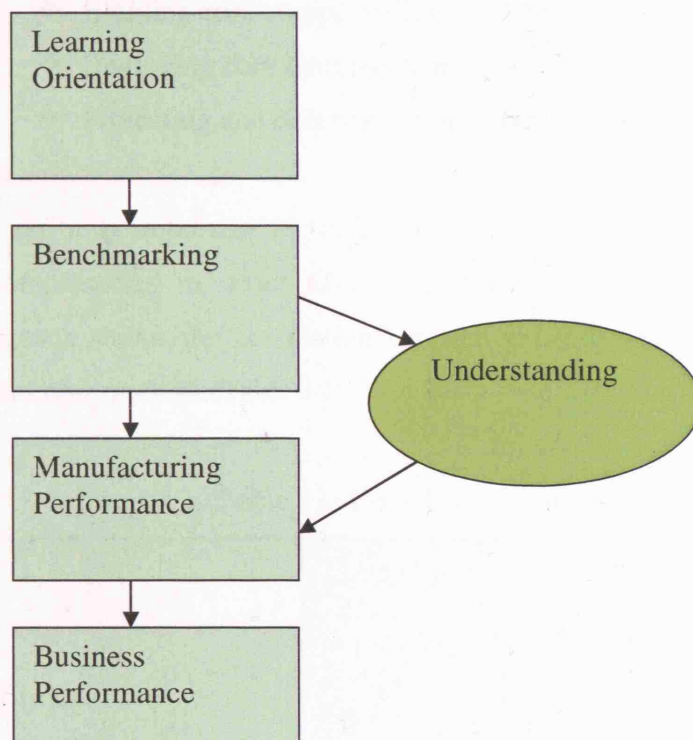
*Source: Johnson and Scholes (1999)*

More and more companies globally adopt benchmarking as a means of understanding what practices are needed in order to achieve top performance. Benchmarking as a tool of knowledge has been widely adopted by companies as a performance improvement tool. In addition, benchmarking has been used as a goal setting process and as an aid in setting performance objectives to achieve performance improvements (Venetucci, 1992). Voss et al., (1997) in their research propose a relationship between learning, benchmarking, understanding and performance. Benchmarking is characterised as a vital part of the learning company's repertoire for performance



improvements. It promotes higher performance through identifying practices and setting challenging goals. Benchmarking, increases a company's understanding and assessment of its strengths and weaknesses in relation to its competition and by doing so it benefits performance as improvement agendas will be focused on real needs.

**Figure 4: The relation of benchmarking, understanding and performance**



*Source: Voss et al. (1997)*

Duysters and Hagedoorn (1996) in their research examine the relationship between core competencies<sup>21</sup> and business performance. Moreover, they examine the effect of the external appropriation of those competencies through mergers and acquisitions or strategic alliances. One of their main conclusions is that the more technology related the business a firm is in, the more those competencies should be generated endogenous.

<sup>21</sup> Core competencies in this research were measured by three main indicators: technological specialization, innovative capabilities and diversification.

Hamel and Prahalad (1994) identify five key management tasks that the management team has to fully understand and participate in, in order for the core competency perspective to develop in an organization:

- ❖ Identifying existing core competencies
- ❖ Establishing a core competence acquisition agenda
- ❖ Building core competencies
- ❖ Deploying core competencies
- ❖ Protecting and defending core competence leadership

First, it is important for a firm to clarify and have knowledge of its existing core competencies in order to manage them properly. Core competencies acquisition agenda shows the correlation between existing and new competencies and existing and new markets (Table 13).

**Table 13: Core Competence Acquisition Agenda**

Core Competence	New	<u>Premier plus 10</u>  What new core competencies will we need to build, protect and extend our franchise in current market?	<u>Mega-opportunities</u>  What new core competencies would we need to build or participate in the most exciting markets of the future?
	Existing	<u>Fill in the blanks</u>  What is the opportunity to improve our position in existing markets by better leveraging our existing core competencies?	<u>White spaces</u>  What new products or services could we create by creatively redeploying or recombining our current core competencies?
		Existing	New
		<b>Market</b>	

Source: Hamel and Prahalad (1994)

Building new core competencies is a lengthy and effort consuming process. Thus, it is very important that the management team shows consistency and stability in which competencies to develop. To leverage core competencies across multiple business areas and into new markets a redeployment of competencies internally, from one division or SBU to another, is necessary. Moreover, it is possible that this redeployment takes place in a geographical diversity, although at this case, a firm should avoid unnecessary geographical fragmentation of its core competencies. History has showed that core competence leadership can be lost in many ways. Lack of funding, fragmentation due to divisionalization, inconsistency from executives and many others are possible reasons that can result in the loss of core competencies leadership. In conclusion, if a firm has safeguarded the existing core competencies, escaped the myopia of existing markets and built a forward looking competence agenda it can move on into expeditionary marketing and global pre-emption (Hamel and Prahalad, 1994).

According to Sanchez (2002) (cited in Gale a., 2004) five organizational competence modes can be identified:

- ❖ Cognitive flexibility to imagine alternative strategic logics: the collective corporate imagination of managers in perceiving feasible market opportunities in which their organization can create value.
- ❖ Cognitive flexibility to imagine alternative management process: it is related with managers' ability to conceive alternative processes of implementing strategies.
- ❖ Coordinative flexibility to identify, configure and deploy resources: it depends on a manager's ability to acquire or access, configure and implement resources so as to achieve strategic goals.
- ❖ Resource flexibility to be used in alternative operations: it relates to the organizations inherent level of flexibility.

- ❖ Operating flexibility in applying skills and capabilities to available resources: it relates to an organization's ability to apply resource flexibility to a range of operating conditions.

#### 4.1. Construction competencies

In regards to Engineering Procurement Construction (EPCs) firms, core competencies can be identified as the following (Smythe, 2005):

- ❖ Collective learning – absent or under-developed in construction
- ❖ Co-ordinating skills – good in construction in task-programme sense
- ❖ Shared understanding of client needs – under-developed in construction
- ❖ Deep understanding of product and service – decreasing understanding with skills shortage at management level of trades and technology
- ❖ Embody intangibles of shared culture and ideology that are mutually beneficial – strong culture but blame based
- ❖ Technical competencies – expertise at delivery of complex and demanding projects
- ❖ Evaluative competencies – expertise at managing risk and value
- ❖ Relational competencies – adversarial relations are slowly being replaced

De Haan et al, (2002), in their research of competencies in the building sector have made the comparison between a design consultant and a contractor (Table 14). The designer focuses a lot on innovative design and in order to achieve this employs highly educated professionals and invests in research and development. The contractor focuses mainly on mass production, in order to minimize costs and marketing strategies in order to sell a mass product as a unique one.

**Table 14: Designer – Contractor Competencies**

	<b>Designer</b>	<b>Contractor</b>
<b>Capability</b>	Innovation: new designs Production: concurrent design and production	Marketing: translating customer's needs into a product

		Production: manufacturing a unique product in mass production
<b>Conditions</b>	<b>Internal: multifunctional design teams</b>	<b>Internal: standardization of skills</b>
	<b>External: layered system</b>	<b>External: standardization of subcontractors by strict procedures and requirements</b>

*De Haan et al. (2002)*

## 4.2. Consultants - perspective

Traditionally consultants provide the technical, cost, contractual and practical advice to clients wishing to develop projects. In general, it can be stated that engineering consultancy is a business with high competition and oversupply leading to relatively low profit margins. Due to the globally noticed major shift in BOOT type projects consultants are forced nowadays to adapt their organization to the new demands of these projects (Mullinger and Grimsey, 1996).

A major change is the shift from being a provider of service for others to profit from (technical advice), to being a user, operator and manager of such services possibly producing a steady cash flow and long term return on investment (Mullinger and Grimsey, 1996). Traditionally, consultants are approached by clients in order to assist in identifying the specific needs of the client and then provide a feasibility study. Later on, once the specific needs have been identified, consultants are asked to develop the final design, cost plan, procure the resources and supervise construction (Mullinger and Grimsey, 1996). Thus, what can be extracted from that role is that consultants are traditionally passive in commercial terms. They concentrate on technical discipline and built in reputation on past projects and achievements. The main difference of privately financed construction projects is that they expect consultants to undertake a proactive role into identifying commercially viable projects to develop. Moreover, since usually consultants do not possess the skills and resources

required for procuring, operating and maintaining these projects they need to seek out assistance in the form of partnerships. The complexity of a BOOT projects strengthens the need for partnership as it is highly unlikely that a single organization possesses all the resources required for the project. In order for the consultant to play its active role in the emerging BOOT market awareness and visibility of the market is needed in addition to partnerships and business relationships of a high level between the other parties involved in such projects. Promoters of BOOT projects increasingly require consultants and contractors to participate in both equity and debt provisions to projects at least until the completion of construction. This is an important break through especially for consultants as their role changes from that of provision of services to an active role affecting the outcome of the project.

An important consideration influencing the choice of partners is the fact that the cost of bidding for the project is significant which in turn indicates that the partners are able and willing to accept the risk<sup>22</sup>. According to the above provision it is important that a formal agreement between all members of the bidding team is put in place in order to clarify each party's intentions and obligations in the bidding process.

An important aspect of successful consulting work on BOT projects is the ability of identifying and projecting the stream of revenue. The revenue estimations that are based on level of use, as in roads, involve an exposure to market risks. The consultants' role is important in the process of identifying and mitigating the risks within the bidding team. Moreover, apart from the base case scenario, contingency plans and the relevant risk mitigation must be analysed in respect of changes in the outcome different than the base (or best) case scenario. In regards to the revenue stream the role of the consultant is to establish the extent of the market that exists for the product and identify the key factors that can affect the market. The existence of a realizable revenue stream is important in order to attract both equity and debt investors (Mullinger and Grimsey, 1996). Once this business case is established, a more detailed and technical planning process can begin.

---

<sup>22</sup> This is often known as a "no win, no fee" situation (Merna and Smith, 1996).

The bidding process involves a member from almost every party of the bidding team. Usually, there is a lead manager, design team leader, operations team leader, construction team leader and of course financial and legal advisors. In order to achieve a winning bid at the least cost, good communication among the different members is needed.

The objectives of the design in order for the bid to be successful must focus on the cost of not only the construction but also the operation and maintenance of the facility. Issues such as whole-life costing and value engineering are very important for the outcome of the bid. In regards to the bidding costs it must be stressed that these are relatively high compared to traditional procurement<sup>23</sup>. Therefore, the bidding team must decide on how the costs are going to be met by the different parties of the consortium. A financial arrangement must take place on how the bidding costs are going to be recovered if the bidding is successful and how they are going to be underwritten by the parties if not.

The nature of the projects is such, that the participation of any consultant in them involves risk<sup>24</sup>. Mullinger and Grimsey (1996), identify the following as the most important risks for consultants entering the BOT market:

- ❖ Inadequate investment in resources
- ❖ Failure to identify the correct combination of projects, sectors and locations for development of new projects
- ❖ Projects taking excessive time to implement
- ❖ Inability to capitalize on opportunities in other consultancy disciplines while the projects are developed
- ❖ Increased exposure of the firm in case the project fails to meet the base case projection
- ❖ Increased competition from other firms as the BOT and PFI markets become more and more popular

---

<sup>23</sup> Up to 15% of the projects capital cost (Merna and Smith, 1996).

<sup>24</sup> It is very likely that some of these projects will not go through which suggests that there would be no remuneration for the costs of putting the team together and preparing the initial studies and design.

The active role of a consultant in identifying and initiating the development of a BOOT project can have the following advantages:

- ❖ The consultant can influence the way the project develops
- ❖ The ability to create a long term investment that can produce a steady cash flow
- ❖ Possibility of creating opportunities in the operational phase of the project on facilities and maintenance management

#### **4.2.1. Core competencies for consultants**

From the analysis conducted above it is obvious that the role of consultants in BOT projects has changed. The basic principle of third-party service provision has been altered and now different capabilities, opportunities and risks are needed from the consultants' participation in these projects. In brief, these competencies can be summarized as the following:

- ❖ Technical design skills
- ❖ Pro-active role in identifying projects and forming partnerships in order to create the bidding team
- ❖ Financial resources and expertise in order to participate in the operational phase of the project
- ❖ Investment competencies in order to make better use of the steady cash flows that result from the participation in the operating scheme of the project
- ❖ Capability of designing not only for the minimum construction cost but for the least life-cycle cost
- ❖ In projects such as roads where the market risk is significant demand forecasting and creation of contingency scenarios is important

Hirst (1996) identifies the following as key positive attributes for consultants:

- ❖ Reputation
- ❖ Financial status



- ❖ Experience
- ❖ Personnel
- ❖ Contacts and relations

The role of consultants in a BOT or PPP/PFI project is multidisciplinary; according to Baxter (1997) <sup>25</sup> consultants can be involved in the following roles:

- Designer (non-equity partner) for concessionaire
- Equity partner for concession company
- Technical advisor /auditor to public sector client at proposal development stage
- Technical monitor to public sector client for a specific project post concession award
- Technical advisor the concession company
- Technical advisor to the financier
- Independent auditor/arbitrator

#### **4.2.2. UK – consultants**

The creation of any new market such as the BOT/PFI market not only creates opportunities for the local firms but for their foreign competitors. UK consultants constitute such a ‘threat’ for local consultants as they are globally renowned for their expertise and experience and are probably the most familiar and competent with BOT and PPP/PFI projects. Thus, it is important to examine their prospects and opportunities on entering the Greek market<sup>26</sup>.

One of the most important advantages of the British consultants would be their ability to prepare speculative bids. In other words prove to the investors, banks and the government the financial viability of a specific project. They can show a more entrepreneurial and innovative approach to a project. Their design and engineering skills would probably be of equal quality but they are more experienced and familiar

---

<sup>25</sup> SWOT analysis of most of these roles for a specific example is given in Appendix B.

<sup>26</sup> A similar comparison in the form of a SWOT analysis has been made in the research of Quattek, (1997) for British consultants entering the recently created German BOOT market.

with life cycle approach and financial engineering which are very important parts of a BOT or PPP/PFI project.

The lack of knowledge of the local legal and regulatory framework is of course a serious drawback for any foreigner entering the Greek market. However, this can be easily addressed through the co-operation in joint ventures with Greek firms. The lack of knowledge of the local language is also a major drawback but not a crucial one.

Baxter (1997) and Hirst (1996) assessed the British consultants by the use of a SWOT analysis in regards to their ability to enter PFI projects. According to their findings common strengths included technical and business credibility, probity, large staff base and strategic links. Smaller consultants cannot match these criteria and so they can't play a major role in such projects. Common weaknesses identified include learning curves to gain the new skills required, poor communication skills and in the equity partnership role lack of corporate finance skills. Common opportunities identified were increased fee rates, generation of competitive advantage, development of strategic alliances and increased scope for innovation. Finally, the most common threats to be identified included lack of influence with the concession group, conflicts of interest generated by fulfilling a particular role with the threats perceived for the equity partner role to be the highest.

#### **4.3. Contractors – perspective**

It is globally accepted that contractors have changed their attitude from a passive role in responding to requests for proposals into a more active one. They have realized that in order to keep a sufficient workload they have to be more creative and identify viable projects and put money and effort into initiating those (Morris, 1997). CIC (1998) also identifies the new role that the contractor has to play in becoming more actively involved in forming bidding coalitions and considering financial issues in a new way.

The roles the contractor can adopt within a PFI project can be identified as the following:

- ❖ The constructor as operator in the leading role
- ❖ The constructor as equal or minor partner in joint venture
- ❖ The constructor as a subcontractor

Private sector and contractors especially have experienced the increased complexity and bidding costs PFI projects involve (CIC, 1998). However, once a bidder has gained experience subsequent bids should be less cost worthy in terms of both money and time to complete. A major issue involving the contractors role in a PFI project is whether the contractor is willing to commit to a long-term investment as is the participation in an SPV or just willing to add more construction work to its portfolio. A contractor's strategy should therefore be formed accordingly to the skills possessed and the desire for commitment in the SPV. According to the Construction Industry Council (1998), a contractor should only step away from the traditional engagement to the long term commitment that PFI involves, if there are prospects of establishing competitive advantage in a market niche by repeated bidding and innovation and if there are long term interests in the project such as facility management or refurbishment or potential for re-use.

In addition, the financial implications of a contractor's involvement in PFI projects should be well understood and clarified. In order be able to bear the financial risks that the first bidding attempts include, a contractor should be able to commit significant expenditure for some time which may have to be entirely written off. Moreover, to finance the construction, the contractor should be able to raise new equity, borrow against its assets or be able to inject in the project enough capital so as to convince the third parties of its own commitment (CIC, 1998). Therefore, it is clear that the financial ratios, gearing and liquidity are vital for the engagement of a contractor in PFI projects<sup>27</sup>.

Three distinctive types of PFI market can be identified (CIC, 1998):

---

<sup>27</sup> This is even more important in regards to the Greek contractors having in mind that a large number of them are facing financial difficulties having raised much debt equity in the past and lacking the cash flows to repay them (Table 8,9).

- Construction related services (for example DBFO roads) where the prime requirement is to provide a constructed facility which requires construction-related skills to operate (such as FM and maintenance).
- Mix of construction and operation that represents the largest part of the PFI market. Such projects would be hospitals and prisons and these projects require the combined skills of contractors and specialists operators.
- Operation related services such as food catering for schools that require the operator to inherit existing facilities and operate them for the public sector.

Having in mind the high bidding costs it is vital for the contractor to bid only for those projects that fall within its technical and financial abilities, are compatible with its strengths and capabilities and represent the best chance for the firm to create a competitive advantage.

#### **4.3.1. Core competencies for contractors**

From the analysis conducted above, with respect to the PFI procurement method, certain prerequisites and capabilities that a contractor should have when bidding for a PFI project arise. Moreover, the fact that a constructor can play various roles within a PFI project, from the simplest and less risky that of a subcontractor to the most complex and risky that of the leader of the SPV, creates the need for various and complex capabilities that a contractor must possess in order to get involved in such projects. The following capabilities are identified as the essential for a contractor to take part in a PFI project:

- ❖ Technical construction skills (buildability and innovation of construction)
- ❖ Bid preparation and management (costly and complex bidding process)
- ❖ Operating skills (FM and maintenance skills)
- ❖ Financial skills (financial strength)
- ❖ Co-ordinating and leadership skills (as the leader of the SPV)

The costs involved in tendering and the length of the bidding process leads smaller sized companies to undertake the role of a subcontractor while bigger companies with higher financial abilities and strengths can be involved in an SPV or even become the leader of the SPV.

## CHAPTER 5 – RESEARCH METHODOLOGY - ANALYSIS

Concluding what has been stated above, the most important competencies identified throughout the literature review and the UK practice for both the contractors and consultants will be presented below. It must be noted that because of the multidisciplinary nature of these projects the role of both the consultant and the contractor is quite different and diverse than traditional projects.

A consultant should focus on acquiring or improving competencies in the following areas:

- ❖ Technical design skills (experience and innovation)
- ❖ Pro-active role in identifying projects
- ❖ Financial expertise to play the median role between the construction oriented contractor and the finance oriented lenders
- ❖ Capability of designing for the minimum life cycle cost
- ❖ Traffic forecasting and creation of contingency scenarios

On the other hand a contractor should give attention to the following areas in order to enter with confidence the area of BOT and PPP/PFI projects:

- ❖ Technical construction skills (buildability and innovation of construction)
- ❖ Bid preparation and management (costly and complex process)
- ❖ Operating skills (facility management and maintenance skills)
- ❖ Financial skills
- ❖ Co-ordination and leadership skills (as the leader of the SPV)

After having identified the main competencies and issues arising from the participation of consultants and contractors in BOT and PPP/PFI projects, it is necessary to examine whether Greek firms are in procession of these competencies and assess their strengths and weaknesses in regards to the new challenges ahead.

The assessment of the capabilities (strengths) and limitations (weaknesses) of the firms was undertaken by the form of semi-structured interviews conducted with members of the Greek construction industry. Prior to the interviews a questionnaire was sent in order to use the answers and structure the interview questions. The interviews intended to obtain an overall depiction of each firm's role and attributes in the privately financed projects context. The list of specific questions asked and a brief summary of the answers are presented in Appendix A. Moreover, a brief presentation in the form of SWOT analysis of dominant British consultants created by past research is given in Appendix B in order to assess the potential competition from UK and find similarities and differences between British and Greek consultants.

A list of the financial status (turnover and number of employees) of the consultants interviewed is given in Table 15. Useful comparisons can be made with the British consultant firms' size and financial status in order to assess their threat of entry in the Greek market and examine whether Greek firms can play an equal role in a joint venture. Table 16 presents the financial data for the contractors interviewed. Moreover, the answers to the questions given in Appendix A should be cross referenced to the following tables in order to examine whether they are being over optimistic or pessimistic in relation to their size and capacity.

**Table 15: Size and capacity of the consultants interviewed**

	<b>Company Name</b>	<b>Total Turnover 2003 (million €)</b>	<b>Number of Employees</b>
1	Doxiadis (Metrotech Group)	10	100
2	Nama	4	80
3	Odomichaniki	1	30

*Source: firms' websites (2005)*

**Table 16: Financial data for the contractors interviewed**

	<b>Company Name</b>	<b>Total Turnover 2004 (million €)</b>	<b>Net Current Assets 2004 (million €)</b>
1	Aktor	680	130
2	Gek – Terna	430	150
3	Themeliodomi	180	50

*Source: firms' websites (2005).*

**Table 17: Interviewees data**

	<b>Company Name</b>	<b>Interviewee Name</b>	<b>Company Position</b>
1	Aktor	Slavis L.	Director
2	Gek – Terna	Kotsanas V.	Director
3	Themeliodomi	Economou N.	Partner
4	Doxiadis (Metrotech Group)	Saratsis Y.	Director
5	Nama	Soilemezoglou G.	Partner
6	Odomichaniki	Mpartzokas A.	Director

*Source: firms' websites (2005).*

### **5.1. Scope of interviews – formation of questions**

The scope of the interview process is to examine the awareness of both the contractors and consultants for such projects. Further on in relation to the specific risks involved in such projects and their differences and peculiarities in comparison to traditional procurement to assess the degree of understanding of these issues and the preparation of the Greek construction industry.

The method of semi-structured interviews was selected instead of only a questionnaire as the former gives the opportunity to the researcher to have both the close ended questions, in the questionnaire, and some open ended to be asked during the one to one conversations. According to Bell (1996) the major advantage of an interview is



adaptability. A skilful researcher can follow up ideas brought up during the conversation, probe and investigate deeper motives and feelings at a level that a questionnaire can never do.

Table 18 includes the specific questions asked in the questionnaire that was sent via e-mail to consultants and contractors. The role of the questionnaire was to get answers to questions that are very specific and close ended so that the interview time can be minimised.

As it can be seen below in parenthesis next to each question is the paragraph or chapter from which it stemmed from. The role of the questionnaire is to cover as many issues as possible from those addressed in the literature review such as risks, concession characteristics, roles a firm can play in a concession, experience, partnerships, competition appraisal etc.

**Table 18: Questionnaires**

	<b>Consultants</b>	<b>Contractors</b>
1	What is your experience in road infrastructure projects (highway design, demand forecasting, tendering preparation) and BOT PFI projects (number and total value of projects approximately)	What is your experience (number and total value of projects) with road infrastructure projects and especially BOT-PFI projects (approximately)
2	In your assessment is there a market for BOT – PFI projects in Greece (chapter 3)	Which of the following distinctive roles are you willing and capable of playing in such projects: constructor as operator in the leading role, constructor as equal or minor partner in joint venture, constructor as a subcontractor (paragraph 4.3)
3	Which of the following distinctive roles are you willing to play in such projects: designer (non-equity partner) for concessionaire, equity partner for concession company, technical advisor/auditor to public sector client at proposal development stage, technical monitor to public sector client for a specific project post concession award,	Have you got the financial ability to get involved in an SPV (or sweat equity) or just deal with the construction work (paragraph 4.3)

technical advisor the concession company,  
independent engineer, technical advisor to the  
financier, independent auditor/arbitrator  
(paragraph 4.2)

- |   |  |  |
|---|--|--|
| 4 | <b>Have you discussed joint ventures with foreign firms (paragraph 3.2)</b>  | <b>Apart from the construction experience have you got any road operation and maintenance experience</b>   |
| 5 | Which of the following describe better your firm's competencies: strong delivery, strong service, strong ideas, strong experience, creativity-innovation, technological competence (paragraph 4.1) | Would you consider investing in road operation and management as a probable core capability of your firm in the near future (paragraph 4.3)  |
| 6 | <b>Are you confident that you can match foreign transport consulting firms (British) technical and financial expertise and get involved as an equal partner in a joint venture (paragraph 3.2)</b> | <b>Can you identify projects and propose speculative bids (paragraph 4.2,4.3)</b>  |
| 7 | Are you willing and capable of having a proactive role in identifying projects and forming partnerships in order to create the bidding team (paragraph 4.2)  | Are you confident that you can match French and Spanish firms technical and financial expertise and get involved as an equal partner in a joint venture  |
| 8 |  | Which of the following describe better your firm's competencies: strong delivery, strong service, strong ideas, strong experience, creativity-innovation, technological competence (paragraph 4.1) |

The next section lists the specific open-ended questions asked on the one on one interviews that took place after getting and processing the questionnaire results. Again, the chapter or paragraph that contributed into creating the question is referenced.

#### Consultants' interview questions

- a. What is your assessment of BOT - PFI projects and how do they alter consultant's work

This question tries to examine the assessment of the consultants' whether a market for these projects exists or will be created in the future and in accordance to what has been said previously (paragraph 4.2) how does it change the work of a consulting firm.

- b. What kind of competencies and experience have you got in order to succeed in that role

This question tries to investigate whether the firms have actually identified their strengths and weaknesses and are aware of their competencies that can help them into successfully entering such projects (paragraph 4.1).

- c. Have you previously collaborated closely with contractors:
- a) Formed a joint venture
  - b) Regularly worked with the same contractor and what can you say about your relationship (friendly, adversarial)

This question raises the issue of previous experience on close collaboration between the consultant and the contractor that is very important in BOT and PPP/PFI projects as it may solve problems related to buildability and life cycle cost (table 2, paragraphs 2.4, 2.5).

- d. How do you assess the possibility of raising equity or debt funds and investing in the SPV (or sweat equity)

The above question rises from paragraph 4.2.1 where the different roles a consultant can play in a concession project are specified. The role of an equity partner is also addressed in the research presented in Appendix B by Baxter (1997) regarding Halcrow.

- e. Have got the capacity to get involved in such lengthy and costly projects and how would it affect ability to capitalize on opportunities in other consultancy disciplines while the projects are developed

This is the question that originates from chapter 2 where the specific issues regarding concessions are presented with the length and cost of these projects being very important. Moreover, because of the above characteristics and due to the small capacity of Greek firms it could create problems on capitalising on other consultancy work (paragraph 4.2).

- f. Are you familiar with the risks involved in such projects and how will you cope with the increased exposure of the firm in case the project fails to meet the base case projection

The risks involved in such projects for both the contractor and the consultant are very important. In addition, especially for a consultant unfamiliar with bearing the bidding costs,<sup>28</sup> the unsuccessful bidding might suggest increased exposure as the 'no win-no fee' situation prevails in such projects. Moreover, a weak demand assessment and contingency planning can have a negative impact on the firm's reputation and continuing work with the same client (paragraph 4.2).

- g. Are you prepared to bear the demand risk and would you be prepared to take part in on equity when the return depends on demand risk

This question is related to the previous two and deals with the assessment of the risks by the consultant.

- h. Do you have the experience and expertise for creating traffic bands for payments in shadow tolls
- i. Are you familiar with the new shadow tolls payment mechanisms including lane availability and accident ratio and what alterations in the design work have to take place

The above questions deal with the issue of direct user charges or no user charges (shadow tolls option) (paragraph 2.1). Moreover, they introduce recent improvements in the shadow tolls system used in UK DBFO roads. Their scope is to examine the

---

<sup>28</sup> Traditionally a consultant works on a contract (lump sum) basis.

consultants' awareness of these issues and whether they possess the required expertise to work with either of these payment mechanisms.

- j. Apart from the main highway network how can concession agreements be used for the secondary network

This is a question that is extremely important for Greece as the condition of the secondary road network is bad and deteriorates constantly. In addition, this network due to the low demand is not by itself attractive for a concession project. The author at this point examines whether the firms have addressed this issue and are in the position to propose specific solutions.

- k. Have you got the capability of designing not only for the minimum construction cost but for the least life-cycle cost

This final question addresses a major issue in BOT and PPP/PFI projects, that of life cycle cost (paragraph 2.5). The role of the consultant at this point is very important as it can identify and propose new innovative solutions (techniques, materials etc.) in order to minimise the life cycle cost of the project.

#### Contractors' interview questions

- a. What is your assessment of government's intentions regarding BOT and PFI projects, do you believe there is a market for such projects in Greece

This question has the scope of examining the degree of awareness and preparation of Greek contractors in relation to the emerging BOT - PPP/PFI market (chapter 3).

- b. Have you discussed with commercial banks of such schemes - are they willing to get involved, have you established a reputation to deliver within lenders, how do you assess the low participation of commercial banks in past projects (availability of EU funds may deteriorate)

In accordance to the above question the close collaboration of contractors and lenders (commercial banks) is necessary in order to be able to create an SPV and bid for projects.

- |   |
|---|
| c. If you get involved in an SPV, how do you appraise the political risk in such a lengthy time period  |
| d. How are you going to manage the risks involved in such projects: design, construction, operation, interest rate, have you got the required expertise and experience and what kind of risks are you willing to take |

The above questions refer to the various risks involved in such projects and try to examine whether the contractors are aware of them and how they are prepared to deal with them (paragraph 2.2).

- |  |
|--|
| e. Are you confident you can undertake the lengthy and costly bidding process for such projects  |
| f. Are you prepared to bear the demand risk and would you be prepared to take part in on equity when the return depends on demand risk |
| g. Would you be prepared to take part in on equity that's not liquid for many years (concession period)                                |

These questions assess the degree of understanding and determination of the contractor in dealing with the specific issues involved in these projects. The issue of bearing demand risk and the low level of liquidity of the investment are very important and change the traditional role of the contractor (paragraph 4.2).

- |   |
|---|
| h. How do you assess the issue that in an SPV the contractor becomes client of the SPV (no opportunity for claims) and how can you make sure that the contractor does not become dominant of the SPV. How would you deal with the issue of the parent company having two different organizations: the contractor and the equity participation in the SPV with conflicting interests |
|---|

This very important subject has emerged throughout the review of various research papers on PFI and was brought up on conversations with members of the Greek

construction industry before the actual interviews. The aim is to see whether the firms are aware of that problem and how they are going to address it.

- |   |
|---|
| i. Are you prepared to co-ordinate with the designer in order to reach a more efficient solution in terms of build ability and how can you reach such goals   |
| j. What is your understanding of whole life cycle cost in a road project  |
| k. Do you think there are improvements in pavement or other technology available but not yet used in Greece and are you willing to invest in such technology in order to achieve a better cost-benefit performance in future projects |

The above set of questions is in accordance to consultant questions c and k and refer to the contractors' understanding of life cycle cost and their determination to implement new methods and technologies in cooperation with the consultants.

- |   |
|---|
| l. How do you appraise domestic and foreign competition (especially French and Spanish firms) |
|---|

This part of the interview refers to the contractors' assessment of domestic and foreign competition and especially French and Spanish firms as they are the ones that prevail and are considered to be experts on road concessions projects.

- |  |
|--|
| m. Are you in possession of investment competencies in order to make better use of the steady cash flows that result from the participation in the operating scheme of the project |
|--|

This question rises from the fact that a contractor participating in a concession company has steady cash flows which in time can be significant and financial and investment competencies will be needed in order to make as better use of the profits as possible (paragraph 4.3).

The answers to the questions will be cross referenced to the experience gained globally and identified throughout the literature review and the British comprehensive experience in such projects. The main issue is to examine whether the necessary conditions in the private sector exist in Greece in order for such a market to mature or

not. Moreover, a major concern is whether the parties involved understand these highly demanding projects and are facing them as a new challenge and not as merely a way of getting cash flows. The degree of difficulty in these projects and the dedication and competence they require demand that any firm involved will deal with them as a strategic movement, as a long term investment in this new procurement route and not as just a source of the badly needed for many Greek contractors (especially after their decrease of turnover after the Olympic Games) source of cash flows.

In accordance to what has been stated above another major matter is whether the Greek construction industry is prepared and capable of facing this challenge and either confront or enter joint ventures with the foreign leading global players in construction that will nonetheless become interested in entering a new market such as Greece. The public sector's determination to move towards BOT and PPP/PFI projects should be looked upon not only as way of creating the badly needed infrastructure but also as an opportunity to create efficient, capable and strong Greek contractors and consultants, able to challenge foreign firms and establish their presence in similar projects in the area of South Eastern Europe and the Middle East.

## **5.2. Outcome of interviews - Analysis**

This chapter has the purpose of presenting the results from both the questionnaire and the taped interviews. Especially for consultants a useful comparison will take place using previous research presented at Appendix B for British consultants.

### **5.2.1. Consultants**

#### Sample formation

The consulting firms interviewed can be noted as multidisciplinary firms with important and excessive experience in various projects in Greece and internationally, on their own or in joint ventures mainly British firms. One of the firms is a highly appreciated highway design focused firm that has extensive experience only in the areas of design and technical advisor on engineering issues (Odomichaniki). This



selection was done on purpose in order to assess the aims and intentions of different consulting firms, both highly focused and multidisciplinary.

### Analysis

All the consultants interviewed agreed that a market for BOT and PPP/PFI projects can be created and become mature in Greece in the years to come with the first such projects currently in the bidding stage. In relation to the relevant roles they can play within the framework of such projects, the majority of the firms believe they can undertake all these roles except for the role of an equity partner which is of limited use in Greece as well as internationally. Of course the firm that specializes only on design currently does not possess such capabilities but provided that the market matures it could consider as a strategic movement to expand and become more multidisciplinary and acquire such competencies. They all agree that a change in consultant's work will take place. A major difference is that their client will be now the private sector and not the public which means that profits will drop and that there will be more pressure in terms of both time and cost.

*“The main difference for the consultant is that the client is now the contractor not the public sector with probably reduced payment”.*

Mr Mpartzokas (Odomichaniki) (See Appendix A-pp.68)

The next answer is to the question regarding their participation in joint ventures and their abilities compared to international consultants (mainly British). Half of the firms have already discussed and participated in joint ventures with foreign firms while the other half have so far worked on their own. In their assessment, the quality and capabilities of the Greek consulting firms can match the foreign firms. However, some firms point out that the presence of foreign firms is sometimes required by international lenders.

*“When international lenders become involved (as in the case of Attica ring road) they will demand the presence in the consulting team of a globally renowned consultant as*

*complementary to the Greek consultant's knowledge of the local market and conditions".*

Mr Saratsis (Doxiadis) (See Appendix A-pp.66)

All the firms conclude that they can be characterised as having strong experience (mainly in highway design), strong delivery and service. While they feel that there is not much room for technological competence due to the use of proven technology. However, this does not mean that there is no room for innovation. In relevance to the important change in a consultant's work, that of acquiring a proactive role, identifying projects and entering speculative bids all the firms agree that they can play such a role and some of them have already done so.

All firms have previously collaborated closely with contractors and besides the unavoidable conflicts, their relationship can be characterised as efficient and friendly. So far they have not formed joint ventures with contractors, but worked with them in a contract basis. In relevance to their ability and will to enter an SPV as an equity partner (or sweat equity), they all agree that this is not a realistic option for the size and capacity of Greek consultants.

It is a common belief that entering such lengthy projects will probably affect the ability to capitalize on other (traditional) consultancy work. As it was mentioned, the issue of "lost opportunities" must be addressed and each firm in relation to their capacity and size should or should not undertake such commitments.

*"There can be a case of lost opportunities when entering these lengthy projects"*

Mr Saratsis (Doxiadis) (See Appendix A-pp.69)

They all seem to be aware of the high risks involved in such projects and some firms through their past role as technical advisors, have experience for forecasting and demand risks. The issue of demand risk and its relation to repeat work and reputation is very important and firms have realised that and are determined to maintain close collaboration with the client in order to achieve the common goals and maintain repeat work.

The firms possess expertise for actual tolls but they have not yet worked on shadow toll roads with the implied expertise on traffic bands. The contemporary shadow toll systems with the induction of lane availability and accident ratios have not yet been addressed by Greek firms. However, there are discussions on implementing penalty ratios in the total turnover of the concessionaire by the actual tolls similar to the lane availability and accident ratio concept. In relation to the actual tolls - shadow tolls discussion, there is the issue of giving out concessions for the secondary network. Nevertheless, discussions are still in a preliminary stage for this highly complicated issue.

Greek consultants have addressed the life cycle cost issue in past projects and are ready to suggest new pavement technologies that will be more efficient in terms of benefit – cost analysis for the whole life cycle of the project. They also believe they have the ability to enforce their ideas to the contractors even if they suggest a technology or method that is more expensive (in construction terms) or more difficult to use. Finally, some of them have got road maintenance experience and are willing to use it as a competency in future projects but do not possess road operation (toll collection etc.) capabilities.

#### Comparison with British consultants

At this point a useful comparison will be made using previous research data presented at Appendix B about British consultants. Using the SWOT analysis for Arup and Halcrow, a comparison will be made regarding the strengths and weaknesses of these leading British firms and if they do exist or not in Greek firms.

British firms can be characterised as having reputation, experience and creativity-innovation (See Appendix B-pp.84). Greek firms certainly can not match their performance especially in the BOT and PPP/PFI market. Moreover, British firms excel in relevance to their size and capacity that enables them to maintain a large staff base including finance specialists and provide unpaid staff time as sweated equity (See Appendix B-pp.84-88). The resources of Greek firms, even the leading ones as those interviewed, are of course limited compared to the British firms.

Finally, in regards to the weaknesses of British firms, the following can be mentioned: members of staff have not adapted to their role within the PFI context, it is time lengthy for staff to adapt to this new role, poor communication skills when conversing with financiers and inability of the firms' to provide equity for some projects (See Appendix B-pp.84-88). Greek firms will also experience the issue of adapting a new culture for the PFI projects. However, due to their smaller size this will take place easier and faster than in the British example. The issue of inability to provide equity or sweat equity is due to the reduced size and capacity and it does not seem that it can change significantly in the near future.

### **5.2.2. Contractors**

#### Sample formation

All contractors selected for interviews fall into the seventh class public works certificate. These firms are the ones that are going to play the major and leading role in BOT and PPP/PFI projects. Aktor and Terna as it can be seen from Table 9 and Table 16 can be characterised as the market leaders with experience on a variety on projects both domestically and internationally. Themeliodomi on the other hand, can be characterised as a more construction oriented firm that does not play the leading role in joint ventures. The aim is again to examine the aims and expectations in relation to their current position and expertise.

#### Analysis

Greek contractors have been involved in various BOT projects with the leading groups (Aktor and Terna) having extensive experience in undertaking the leading role (in collaboration with foreign, mainly French firms) and the smaller ones having undertaken only the construction work (Themeliodomi). Moreover, the market leaders feel confident that they can enter as equity partners an SPV. Aktor group from the involvement in Attica ring road and the Rio Antirio Bridge at the operating stage has in possession road operation competencies while the other firms feel that the area of road operation is an area they should focus and invest in the near future.

The firms interviewed are confident that they have the ability to propose speculative bids and change their strategy consequently into a more proactive one in order to succeed in this role.

*“Speculative bids is something we have already done on international projects”*

Mr Kotsanas (Terna) (See Appendix A-pp.75)

It is their belief, that although French and Spanish firms are highly competitive, (especially in road projects with German firms following), they can match their expertise and enter as equal partners in joint ventures. In relevance to their capabilities, they believe that they are strong in experience, efficiency, innovation and ideas and lack only in terms of capacity and availability of equipment and personnel.

All firms agree that the need for the creation of such a market in Greece is imperative and they feel that there is the political will towards this objective. Accordingly, they have already discussed with commercial banks for such schemes and they feel that they are prepared to enter such projects provided that the legal framework exists.

*“The lack of the necessary legal framework prohibits commercial banks from participating widely in these projects”.*

Mr Slavis (Aktor) (See Appendix A-pp.77)

Contractors are aware of the risks involved in such lengthy projects and are ready and willing to invest into such long term investments with liquidity after many years as a corporate strategy for the future (mainly the leading firms Aktor and Terna). They feel that demand risk is something they can cope with and they are prepared to undertake it and enter such long term concession schemes.

In relevance to the long and costly bidding stage for these projects, they all agree that it is indeed a problem that it should be addressed in the near future. Moreover, this is an area where Greek contractors lacking the capacity to have specialized and large bidding departments can not match international contractors.

*“However, a more simplified and standardised bidding system such as the Spanish in contrast with the British one, will have positive effects in the reduction of both cost and time of the bidding process”.*

Mr Slavis (Aktor) (See Appendix A-pp.78)

A major issue that arose in any country that implemented BOT PPP/PFI schemes is that within a group there might be a contracting and a concessionaire part having conflicting interests. Traditionally, a contractor puts up claims to cover for deviations of both time and cost from the program. Within the framework of such projects this is unacceptable as any delay or raise in construction cost is affecting the performance of the concession company. This issue has been already experienced in one Greek contractor (Aktor) and although they did support the contracting part they are determined to change their attitude and face this problem by ensuring that these different companies of the same parent company are dealt as two different companies. This means that there is not any room for claims and all contracts should be turn key contracts with any losses or budgetary deficits having to be faced by the subsidiary in total.

*“We experienced this issue in our involvement in the car parks. As a group we are interested that both the contracting and the concessionaire part grow and are successful”.*

Mr Slavis (Aktor) (See Appendix A-pp.80)

The issue of life cycle cost and the impact it has in contracting work, where the contractor does not look after the minimum construction cost anymore as it is the contractor that also operates and maintains the project, has been addressed by the firms interviewed. The contractors are willing to implement any new more efficient ideas proposed by the consultants and collaborate closely with them in order to achieve a minimum life cycle cost. This collaboration also applies to the issue of buildability that is very important especially in these projects.

Contractors are willing to invest in more efficient pavement equipment and technology provided that the public sector gives them the ability to alter the current specifications or lets them deal on their own with the issue of design. They understand

that without the adequate transfer of risk of design and input specifications to the contractor they can not address the issue of life cycle cost completely. At this point, it is very important to point out that the public sector needs to change its attitude and culture from the traditional procurement route, into setting only output specifications and giving the concessionaire the ability and freedom of movement to implement any method or technology available.

*“The issue of setting output specifications and controlling them has not yet been understood by the public sector due to their culture...This contemplation to old practices and specifications affects negatively both the life cycle cost of the project and the concessionaire’s performance”.*

Mr Slavis (Aktor) (See Appendix A-pp.82)

Finally, they believe that with the current number of concession projects, there is not the need to create a separate financial (and investment) department in order to exploit the steady cash flows from the participation in concession projects. However, provided that the market matures and they become more and more exposed in such projects this could be an option.

that without the adequate transfer of risk of design and input specifications to the contractor they can not address the issue of life cycle cost completely. At this point, it is very important to point out that the public sector needs to change its attitude and culture from the traditional procurement route, into setting only output specifications and giving the concessionaire the ability and freedom of movement to implement any method or technology available.

*“The issue of setting output specifications and controlling them has not yet been understood by the public sector due to their culture...This contemplation to old practices and specifications affects negatively both the life cycle cost of the project and the concessionaire’s performance”.*

Mr Slavis (Aktor) (See Appendix A-pp.82)

Finally, they believe that with the current number of concession projects, there is not the need to create a separate financial (and investment) department in order to exploit the steady cash flows from the participation in concession projects. However, provided that the market matures and they become more and more exposed in such projects this could be an option.



## **CHAPTER 6 – CONCLUSIONS - RECOMMENDATIONS**

### **6.1. Report overview**

The aim of this research is to assess the preparation and alertness of the Greek construction industry for BOT and PPP/PFI projects that seem to prevail as the new procurement route for infrastructure projects in Greece in the near future. In order to do so a research and assessment of the core competences needed for this scope took place.

This report focuses mainly on the specific issues faced in transport concession projects. The second chapter focuses on concession practice in Europe and internationally and the different methods of tolls used. Moreover, the risks involved in BOT and PPP/PFI projects and especially transport concession projects are mentioned. Incentive contracts and life cycle cost, probably the most important changes compared to traditional procurement, are discussed also in these pages.

Chapter three deals with the present situation in the Greek construction industry, mainly contractors, and examines their financial situation and briefly mentions the past concessions constructed and the ones to be constructed in the near future.

Chapter four is an identification of core competencies throughout an extensive literature review. In addition, specific core competencies for consultants and contractors are identified throughout literature and past research focused on British consultants and contractors. The aim is to identify those specific competencies that are required for the successful participation in these projects by consultants and contractors.

Chapter five, the most important and the one that characterises this research, refers to the interview process. The method that was followed, the selection of the firms and their position in the market, is explained and justified as means of producing the desired outcome. Also, the reason why these questions are important and how they emerged from literature review is shown in these chapter. The answers to each of the

questions are given as a summary of what was stated by each member of the firms interviewed.

Finally, a critic of the answers given in relevance to the current situation and the specific needs and issues of these projects is presented in order to evaluate the level of readiness of the firms for participation in these projects.

## 6.2. Key learning points

This chapter aims to briefly state the key learning points for each of the groups interviewed, consultants and contractors.

### **Table 19: Key learning points – Consultants**

**Most of them have the required experience and expertise to work on BOT and PPP/PFI projects on their own or in joint ventures with mainly British firms as they have already done in the past**

They strongly believe that these projects will prevail in the future and thus they will have to plan their strategy in order to be able to play as many of the roles as possible a consultant can play within these projects

**Within the above framework they are prepared to propose and embark on speculative bids and some of them have already practiced it**

They are very realistic in realising that they can not participate as equity (even sweat equity) partners in an SPV due to the limitations of the size and capacity of Greek firms

**They strongly suggest that they are prepared to take the risks involved in such projects, such as demand risk, and bear the increased exposure that this means in comparison to traditional consulting work**

Moreover, they agree that the lengthy and costly bids for these projects will have an impact on their ability to capitalise on traditional consulting work

**A very important issue, in relation to their preparation and alertness of the specific needs of these projects, is that they are prepared to design not for the least construction cost but for the least life cycle cost, and in order to do so, examine the new pavement technologies in practice internationally**

**Table 20: Key learning points - Contractors**

The majority of the firms interviewed have already participated in such projects and are well aware of their specificity in comparison to traditional procurement routes

Having the above in mind they believe that they have the resources, financial and others, to participate in these projects at the leading role or as equal partners in joint ventures with foreign firms

They believe that road operation and management is a capability they need to invest in the near future and some of them, through their participation in the operator of Attica ring road and the Rio Antirrio Bridge, have already done so

French and Spanish firms are traditionally strong in relation to road projects and the Greek contractors having realised that, have joined joint ventures with them

The fact that a concession is very lengthy and additionally an investment of low liquidity has been addressed and contractors are willing to deal with concession projects as long term investments, and bear both the demand and political risk that this implies

They are prepared to collaborate and coordinate with the designer in order to implement new and more efficient pavement or other technologies in order to address the issue of life cycle cost

Finally, a major issue identified globally, that of the conflicting interests of a contracting subsidiary and a concession subsidiary of the same parent company, has been also experienced in Greece and contractors are decisive and prepared to deal with this issue by facing these two subsidiaries as two different companies completely independent

**6.3. Conclusions - recommendations**

The outcome of this research can be characterised as quite important in regards to a new era in infrastructure procurement underway in Greece. The participation of the Greek construction industry including consultants and contractors is extremely important for the successful implementation of BOT and PPP/PFI projects in Greece. However, since the current experience in these projects is very limited it would be more than useful, not to say of imperative importance, to cross reference the outcome of this research with results of various such projects when the market for them matures. It would be valuable then to examine whether the expectations and envisions of the people interviewed became reality or they were either over or under optimistic. We must keep in mind that although British firms have got involved in such projects

since early '90's, it took them probably a decade to become experienced and gain the necessary expertise in order to feel confident and be successful with these projects (although exceptions do exist).

In conclusion, this attempt to identify the core competencies needed for such projects and the implied assessment of whether they do exist within the Greek firms willing to participate in these projects, should be followed by a practical and not theoretical examination of the outcome of the first such projects. Greek construction industry and engineers have historically proved that they are capable and efficient to face any new challenge. This remains to be proven by a research similar to the present within the next decade, when the first group of BOT and PPP/PFI projects will have been completed.

## BIBLIOGRAPHY

- 1) Baxter A., (1997), *PFI - the challenge for civil engineering consultants*, unpublished MSc Thesis, Bartlett School of Graduate Studies, University College London, London.
- 2) Bell, J (1996), *Doing Your Research Project: A guide for first-time researchers in education and social science*, Buckingham: Open University Press.
- 3) Bousquet F. and Fayard A., (2001), *Road Infrastructure Concession Practise in Europe*, The World Bank, World Bank Institute, Governance Regulation and Finance Division.
- 4) Brealey R. and Myers S., (1996) *Principles of corporate finance*, (fifth edition), London, Mc Graw Hill
- 5) CIRIA, (2001), *Construction contract incentive schemes – lessons from experience*, London.
- 6) Construction Industry Council, (1998), *Constructors Key Guide to PFI*, London: Thomas Telford.
- 7) De Haan J. et al., (2002), *Market strategies and core capabilities in the building industry*, *Construction Management and Economics*, vol. 20, pp. 109-118.
- 8) Duysters G. and Hagedoorn J., (1996), *Effect of core competence building on company performance*, MERIT, Faculty of Economics and Business Administration, University of Limburg, Maastricht (Netherlands).
- 9) Eagan J., (1998), *Rethinking Construction*, Department of the environment, Transport and the Regions and HMSO, London.
- 10) Gale A., (2004), *Competencies: Organizational and Personal*, in Pinto J and Morris (eds), *Wiley Guide to Managing Projects*, New Jersey: John Wiley and Sons, pp. 1087-1111.
- 11) Giannaros I., (2005), *Project Finance – PPP/PFI Methodology*, Paper presented to the Conference for Public Works, Technical Chamber of Greece, Athens 19-21 April 2005.
- 12) Hamel G. and Prahalad C.K., (1994), *Competing for the Future*, Boston Massachusetts: Harvard Business School Press.
- 13) Haynes L. and Roden N., (1999), *Commercialising the management and maintenance of trunk roads in the United Kingdom*, *Transportation*, vol. 26, pp. 31-54, the Netherlands, Kluwer Academic Publishers.

- 14) Heggie I., (1999), **Commercially managed road funds: managing roads like a business, not like a bureaucracy**, Transportation, vol. 26, pp. 87-111, the Netherlands, Kluwer Academic Publishers.
- 15) Hellenic Association of Consulting Firms (2005), [www.segm.gr](http://www.segm.gr).
- 16) Hirst L., (1996), **Private finance and engineering consultants**, unpublished MSc Thesis, Bartlett School of Graduate Studies, University College London, London.
- 17) Ive G., (1995), **Client and the construction process: the Latham report in context**, Bartlett School of Graduate Studies, University College London, London.
- 18) Johnson G. and Scholes K., (1999), **Exploring Corporate Strategy: text and cases**, London: FT Prentice Hall.
- 19) Jurasz J., (2003), **Geometric Modelling for Computer Integrated Road Construction**, unpublished PhD Thesis, University of Karlsruhe.
- 20) Kaltsounis A., (2004), **Strategic Planning and Possibilities of Upgrading the Main Road Network**, Technica Chronica Science Journal, Technical Chamber of Greece, Athens, Greece.
- 21) Merna A. and Smith N.J. (eds.), (1996), **Projects Procured by Privately Financed Concession Contracts**, Hong Kong: Asia Law & Practice Ltd.
- 22) Mintzberg H. and Quinn J. B., (1990), **Strategy Process: Concepts, Contexts, Cases**, London: Prentice Hall International.
- 23) Morris P., (1997), **Management of Projects**, London: Thomas Telford Services.
- 24) Mullinger P. and Grimsey D., (1996), **Consultants Perspective**, in Merna A. and Smith N.J. (eds.), (1996), **Projects Procured by Privately Financed Concession Contracts**, Hong Kong: Asia Law & Practice Ltd pp. 109-118
- 25) Quattek M., (1997), **BOOT: Investment opportunities for British Consultants in the German Construction Market**, unpublished MSc Thesis, Bartlett School of Graduate Studies, University College London, London.
- 26) Smythe H., (2005), **Construction Firm: Contractors and Subcontractors**, PE11 Lecture Notes, Bartlett School of Graduate Studies, University College London, London.
- 27) Thomas A.V. et al., (2003), **Risk perception analysis of BOT road project participants in India**, Construction Management & Economics, vol. 21, pp. 393 – 407.

- 28) Tsampoulas D., (2003), **Transport Infrastructure Concession Projects in Greece**, *Technica Chronica Science Journal*, Technical Chamber of Greece.
- 29) Venetucci R., (1992), **Benchmarking: a reality check for strategy and performance objectives**, *Production and Inventory Management Journal*, vol. 33., pp. 32-36.
- 30) Voss C. et al., (1997), **Benchmarking and Operational Performance: some empirical results**, *International Journal of Operations & Production Management*, vol. 17, pp. 1046-1058, MCB University Press.
- 31) Walker C. and Smith A., (1997), **Privatised Infrastructure: the BOT Approach**, London: Thomas Telford.
- 32) Winch G., (2002), **Managing Construction Projects**, Oxford: Blackwell Science.

### **Additional Bibliography**

- Ashmore D., and Harris N., (2000), **Using risk analysis to determine the potential range of lifecycle costs for urban transit systems**, *Transport Reviews*, vol. 20, no. 4, pp. 403- 420.
- Barbara Moreira Barbosa de Brito, (2000), **Concession Contract in Road Maintenance: viability for the English and Scottish Trunk Roads Networks**, unpublished MSc Thesis, Bartlett School of Graduate Studies, University College London, London.
- Construction Industry Council, (2000), **Role of Cost Saving and Innovation in PFI**, London: Thomas Telford.
- Ddembe, A., (2002), **Initiating and managing innovation in road construction: the case of geosynthetics**, unpublished MSc Thesis, Bartlett School of Graduate Studies, University College London, London
- European Commission White Paper, **European transport policy for 2010: time to decide**, Luxembourg: Office for Official Publications of the European Communities, 2001. .
- Economic Construction Institute, (2005), **Task Force for the PPP/PFI and Concession Contracts**, Athens, Greece.
- Hasegawa F., (1988), **Built by Japan: Competitive Strategies of the Japanese Construction Industry**, New York: John Wiley and Sons.
- Joo H., (2003), **Procurement of privately financed road projects: a study of Korean and UK practices**, unpublished MSc Thesis, Bartlett School of Graduate Studies, University College London, London.

- *NAO (1999), **Private Finance Initiative: the first four Design, Build, Finance and Operate roads contracts**, London, HMSO.*
- *Takamasa K. and Miki I., (2003), **Japanese Experiences in Private Participation in Infrastructure: From the Third Sector Scheme to the PFI Method**, Japan Economic Research Institute.*
- *Tiong R., (1995), **Risk Guarantees in BOT Tender**, *Journal of Construction Engineering and Management*, Vol. 121, pp. 183-188.*
- *Tsiridou R., (2000), **Financing Risk When Entering a BOT Contract: a Case Study of Attiki Odos Motorway**, unpublished MSc Thesis, Bartlett School of Graduate Studies, University College London, London.*
- *Winch G. and Schneider E., (1993), **Strategic management of architectural practice**, *Construction Economics and Management*.*
- *Zaidi S.M., (2002), **Design Quality in PFI**, unpublished MSc Thesis, Bartlett School of Graduate Studies, University College London, London.*



**APPENDIX A****CONSULTANTS - INTERVIEW QUESTIONNAIRE**

- 1. What is your experience in road infrastructure projects (highway design, demand forecasting, tendering preparation) and BOOT PFI projects (number and total value of projects approximately)**

*Nama: the firm is experienced in highway design, demand forecasting, tendering preparation. Total value of the firm's participation in these projects approximately € 7 billion*

*Doxiadis: the firm is experienced in all aspects of road infrastructure development (design, forecasting, tendering preparation). The firm is currently employed as a technical advisor to the Public Sector for the 4 concession road projects currently in the bidding process (total value of projects € 4 million), technical advisor to the lenders (Emporiki bank) for a large building concession project in Salonica (total value of the project around € 0.14 million). During the past the firm was employed as the technical advisor to the public sector for the Maliakos gulf crossing (total value of the project € 2 million), technical advisor for the group of commercial banks (leader Bank of Tokyo Mitsubishi) for the Attica ring road (total value of the project € 2 million).*

*Odomichaniki: the firm is mainly experienced in highway design.*

- 2. In your assessment is there a market for BOOT – PFI projects in Greece**

*Nama: the firm's assessment is that there is such a market although it must be noted that all the major highways have already been tendered out.*

*Doxiadis: the firm's belief is that such a market is being created in Greece and the first signs of it are the major highways that are currently in the bidding process. The need for infrastructure is very urgent in Greece which due to the limitation of public funding requires the more active participation of the private sector in such projects.*

*Odomichaniki: our belief is that there will be such a market in Greece.*

- 3. Which of the following distinctive roles are you willing to play in such projects: designer (non-equity partner) for concessionaire, equity partner for concession company, technical advisor/auditor to public sector client at proposal development stage, technical monitor to public sector client for a specific project post concession award, technical advisor the concession company, independent engineer, technical advisor to the financier, independent auditor/arbitrator**

*Nama: the firm has the capability and experience to undertake the roles of the designer (non-equity partner), technical advisor/auditor to public sector client at proposal development stage, technical monitor to public sector client for a specific project post concession award, technical advisor the concession company, technical advisor to the financier, independent auditor/arbitrator.*

*Doxiadis: the firm can undertake all the above roles except the equity partner which has limited application to a consultant and also the role of technical advisor to the concession company has limited or no application in Greece as the concession companies believe they have the required expertise to undertake this role on their own.*

*Odomichaniki: the firm has the ability to play the role of the designer (not equity partner) and the role of an independent engineer.*

**4. Have you discussed joint ventures with foreign firms**

*Nama: not so far.*

*Doxiadis: the firm so far has worked with various leading British consulting firms such as Halcrow and Fauber Mansell and has participated in various joint ventures in projects all around the world.*

*Odomichaniki: not so far.*

**5. Which of the following describe better your firm's competencies: strong delivery, strong service, strong ideas, strong experience, creativity-innovation, technological competence**

*Nama: the firm can be characterised as having strong delivery, strong experience and creativity-innovation.*

*Doxiadis: apart from technological competence (the technology in engineering consultants is more or less given) the firm can be characterised by all the above.*

*Odomichaniki: strong delivery, strong service, strong experience.*

**6. Are you confident that you can match foreign transport consulting firms(British) technical and financial expertise and get involved as an equal partner in a joint venture**

*Nama: it is our belief that we can.*

*Doxiadis: the firm has gained the experience to get involved as an equal partner in such joint ventures although in projects that international banks*

*and lenders get involved they will require the presence of a well known international consultant to give the credibility required in the joint venture.*

*Odomichaniki: we are confident that we can get involved as the designer in a joint venture.*

**7. Are you willing and capable of having a pro-active role in identifying projects and forming partnerships in order to create the bidding team**

*Nama: we believe that we possess such capability and can undertake such a role.*

*Doxiadis: although currently there is no such practice in Greece, the company has undertaken such a role in international projects and is willing to undertake this role in the future given the necessary conditions in Greece.*

*Odomichaniki: we believe that we can undertake such a role at a preliminary phase.*

## **CONSULTANTS - TAPED INTERVIEWS**

**1. What is your assessment of BOOT - PFI projects and how do they alter consultant's work**

*Nama: they will prevail for major highway projects and the consultants work will become constraint time wise.*

*Doxiadis: the traditional role of the designer is not altered in concession projects. However, a consultant must have various other competencies apart from the designing part, it must comprehend the different disciplines and cultures the various parties in a joint venture possess, it must be able to understand finance, risk allocation, legal terms and various other aspects of concession contracts.*

*Odomichaniki: these projects are necessary for infrastructure projects to go ahead. The main difference for the consultant is that the client is the contractor not the public sector with probably reduced payment. However, this does not mean that the quality of the design is worse than before where the client is the public sector.*

**2. What kind of competencies and experience have you got in order to succeed in that role**

*Nama: our main competencies are strong delivery, creativity-innovation and technological competence.*

*Doxiadis: the two distinctive aspects of the role of the consultant in such projects are: behavioural characteristics in order to succeed in a joint venture, (co-ordination of the team, team building, establishing trust between the various parties, risk allocation, bridging the various different cultures and behaviours) and engineering knowledge and experience. The firm has proved that can undertake such a role successfully.*

*Odomichaniki: we have strong experience and reputation as a highway design firm.*

**3. Have you previously collaborated closely with contractors:**

**a) Formed a joint venture**

**b) Regularly worked with the same contractor and what can you say about your relationship (friendly, adversarial)**

*Nama: we have not formed a joint venture yet. We have worked closely with several contractors and have experienced a friendly relationship.*

*Doxiadis: yes, but have not formed a joint venture. We have not worked regularly with the same contractor but with various and experienced a friendly and effective relationship.*

*Odomichaniki: we have collaborated closely but have not got involved in joint ventures and bids. The relationship could be characterised as friendly.*

**4. How do you assess the possibility of raising equity or debt funds and investing in the SPV (or sweat equity)**

*Nama: we are not interested in being involved as an equity (or sweat equity) partner.*

*Doxiadis: within the Greek market there is not such a possibility.*

*Odomichaniki: in our assessment there is not such a possibility for our firm and within the Greek market. The size of Greek firms does not allow them to consider such options.*

**5. Have got the capacity to get involve in such lengthy and costly projects and how would it affect ability to capitalize on opportunities in other consultancy disciplines while the projects develop**

*Nama: we have the capacity but these projects will affect the ability to capitalize on opportunities in other consultancy work.*

*Doxiadis: our firm has the required resources for such projects. However, there can be a case of "lost opportunities", for example in some projects we are technical advisors to the public sector and by definition can not get involved in the bidding team but generally speaking it is a matter of the firm's marketing strategy.*

*Odomichaniki: the capacity of our firm does not give us the ability to create a dedicated part of our office for these projects and working on such a project will affect our ability to undertake other consultancy work.*

- 6. Are you familiar with the risks involved in such projects and how will you cope with the increased exposure of the firm in case the project fails to meet the base case projection (loss of repeat work, reputation)**

*Nama; we are familiar with the risks, we pay attention and maintain close collaboration with the client.*

*Doxiadis: we are familiar with those risks and have got the required experience. The exposure is indeed increased but a consultant with the adequate scale can get involved with such projects.*

*Odomichaniki: the risk exposure for the consultant is less than the risks of the contractor.*

- 7. Are you prepared to bear the demand risk and would you be prepared to take part in on equity when the return depends on demand risk**

*Nama: yes, we are prepared to bear the demand risk (as a technical advisor) but not take part on equity.*

*Doxiadis: we are not interested in taking part on equity.*

*Odomichaniki: we do not have the ability to participate on equity and have not got experience on traffic demand.*

- 8. Do you have the experience and expertise for creating traffic bands for payments in shadow tolls**

*Nama: not for shadow tolls but for actual tolls.*

*Doxiadis: we have not yet got involved in shadow tolls payment mechanisms.*

*Odomichaniki: no we have not got such experience.*

**9. Are you familiar with the new shadow tolls payment mechanisms including lane availability and accident ratio and what alterations in the design work have to take place**

*Nama: practically we are not familiar with these alterations in shadow tolls mechanisms.*

*Doxiadis: we are familiar but in Greece these issues will be addressed as penalty ratios within the concession contract. The payment takes place by actual tolls but in order to maintain the required operational level a number of penalty ratios will be applied and if they are not met deductions from the concessionaire's turnover will take place.*

*Odomichaniki: we are not familiar with these issues.*

**10. Apart from the main highway network how can concession agreements be used for the secondary network**

*Nama: we have not touched yet this option, but soon we will start discussions on the subject.*

*Doxiadis: there is discussion on the subject but in a preliminary stage so far.*

*Odomichaniki: this is a main issue but the example of using direct tolls for the secondary network is socially unacceptable, but still there is much room for discussion on this issue.*



**11. Have you got the capability of designing not only for the minimum construction cost but for the least life-cycle cost**

*Nama: yes, we are addressing the issue of life cycle cost in our design.*

*Doxiadis: we process such skills and have got the experience.*

*Odomichaniki: we have this capability and we have such experience.*

**12. Are you willing to invest into innovative more efficient pavement technologies and have you got the ability to implement them in a joint venture with a contractor**

*Nama: the issue may be raised during the development of the concession projects underway in the country.*

*Doxiadis: we have not addressed these issues yet but Greek contractors have in Attica ring road.*

*Odomichaniki: in our involvement in Attica ring road we got familiar with such issues and we you would be willing to address the issue of more efficient pavements in future projects within the framework of our co-operation with the National Technical University of Athens. But a major issue is whether the contractors are willing to get involved in such new technologies and invest in such equipment.*

## CONTRACTORS - INTERVIEW QUESTIONNAIRE

- 1. What is your experience (number and total value of projects) with road infrastructure projects and especially BOOT-PFI projects (approximately)**

*Aktor: the company has been involved in various concession projects such as the Attica ring road, the Rio-Antirrio Bridge, in various car parks and building projects. Moreover, the firm has participation in the operator of both Attica ring road and Rio-Antirrio Bridge.*

*Terna: the group has been involved in various projects such as car parks, wind generator parks and highways.*

*Themeliodomi: the firm has been involved in various projects as member of joint ventures.*

- 2. Which of the following distinctive roles are you willing and capable of playing in such projects: constructor as operator in the leading role, constructor as equal or minor partner in joint venture, constructor as a subcontractor**

*Aktor: the firm is capable of playing the major and leading role in a concession project due to both the experience and capacity of the firm as well as all the other roles involved in such projects.*

*Terna: the group has the capability of undertaking all the above roles due to both the capacity and experience.*

*Themeliodomi: the firm can play all the above roles.*

**3. Have you got the financial ability to get involved in an SPV (or sweat equity) or just deal with the construction work**

*Aktor: the group is capable and willing to take part in the SPV in a concession project.*

*Terna: the group has the ability to participate in the SPV.*

*Themeliodomi: the firm's main interest would be to get involved with the construction work as we are in the middle of a restructuring and consolidating process. .*

**4. Apart from the construction experience have you got any road operation and maintenance experience**

*Aktor: as participants in the operator of various concession projects in Greece and internationally we have the capability to operate and maintain road projects within the concession framework.*

*Terna: we have not yet got such experience but we are willing to gain such experiences through our participation in bids for various road concession projects underway.*

*Themeliodomi: no we have not yet got any such experience.*

**5. Would you consider investing in road operation and management as a probable core capability of your firm in the near future**

*Aktor: we do and we already consider road operation and management as a core capability of our group.*

*Terna: if you succeed in our bids then we would consider such capabilities as core for our group.*

*Themeliodomi: it is one of our future options to diversify into such areas.*

**6. Can you identify projects and propose speculative bids**

*Aktor: the firm is capable of identifying such projects provided that the necessary prerequisites take place.*

*Terna: provided that the market matures we can identify speculative bids and have already done it in international projects.*

*Themeliodomi: we are capable within a joint venture of proposing speculative bids.*

**7.Are you confident that you can match French and Spanish firms technical and financial expertise and get involved as an equal partner in a joint venture**

*Aktor: the firm has collaborated closely with French companies (especially Vinci) in various projects in Greece. Spanish firms have not yet established successfully their presence in the Greek market. Generally the firm is confident that it can be regarded as an equal partner in joint ventures with these firms. However, the size and capacity of these firms can not be match by Greek contractors.*

*Terna: Spanish firms are more familiar with road concessions compared with French firms. German firms although they lack this experience are very strong in technological and financial terms. Competition is thus very high and will be very intense in the future.*

*Themeliodomi: the firm has the belief that it can enter a joint venture as an equal partner with foreign firms and has already done so.*

**8. Which of the following describe better your firm's competencies:  
strong delivery, strong service, strong ideas, strong experience,  
creativity-innovation, technological competence**

*Aktor: the main advantage of the firm can be mentioned mainly as the knowledge of local conditions (mainly authorities), strong delivery, experience and service. International firms are more competent in technological terms due to their capacity. In terms of creativity and innovation Greek firms have proved that we can match foreign firms. Generally speaking Greek firms lack in capacity, availability of equipment and personnel.*

*Terna: our group can be described by all of these capabilities as we are dealing with various and multidisciplinary (especially in the energy sector) projects internationally.*

*Themeliodomi: strong experience and strong delivery can be used to describe our firm.*

## **CONTRACTORS - TAPED INTERVIEWS**

**9. What is your assessment of government's intentions regarding BOOT and PFI projects, do you believe there is a market for such projects in Greece**

*Aktor: the firm believes that such a market exists in Greece and not only the government but also local authorities are interested in such projects but they lack the necessary experience and knowledge of the distinctiveness of these projects.*

*Terna: there will be such a market unless there is a major political change (for example the negative result on the referendum in France for the EU constitution) that can lead to a major upturn to the global trend for such projects.*

*Themeliodomi: the feeling is that there is the political will towards the creation of a BOOT market in Greece.*

**10. Have you discussed with commercial banks of such schemes- are they willing to get involved, have you established a reputation to deliver within lenders, how do you assess the low participation of commercial banks in past projects (availability of EU funds may deteriorate)**

*Aktor: we have discussed with commercial banks for concession projects but there is lack of the necessary legal framework that prohibits commercial banks to participate widely in these projects.*

*Terna: we already have discussed with most of the major commercial banks both Greek and international especially for the energy sector (natural gas, wind generators etc.)*

*Themeliodomi: we are in constant discussions with banks regarding various projects.*

**11. If you get involved in an SPV, how do you appraise the political risk in such a lengthy time period**

*Aktor: political risk is always present although Greece in contrast with the past has entered a stable political era and concession projects are unanimously accepted by all political parties.*

*Terna: this is an issue and a risk that can not be managed and is common for every firm.*

*Themeliodomi: this is an issue that is of no concern nowadays.*

**12. How are you going to manage the risks involved in such projects: design, construction, operation, interest rate, have you got the required expertise and experience and what kind of risks are you willing to take**

*Aktor: we have the experience to control the design so as to prevent any errors and improve constructability. We can control efficiently the construction part and have experience in operation of concession projects. The risk of interest rate is common for all the members of the EU and can not be managed independently.*

*Terna: we believe that through our experience and expertise we can manage and identify all the risks involved in such projects.*

*Themeliodomi: we have both the experience and the capability to undertake the construction risks and in collaboration with others to undertake the rest risks.*

**13. Are you confident you can undertake the lengthy and costly bidding process for such projects (bid preparation and management)**

*Aktor: we have proved that we are able to undertake such lengthy and costly bids and although we lack the capacity (dedicated bid department with enough capacity) we have been successful in bid preparation and management. However, a more simplified and standardized bidding system such as the Spanish in contrast with the British one will have positive effects in the reduction of both the cost and time of the bidding process.*

*Terna: this is a major issue and any firm that bids must possess both the financial capacity and know-how. In order for a project to go through as a concession it must have a budget in excess of 50m €.*

*Themeliodomi: this is indeed an important issue for these projects but we are sure that we can accept and manage this risk.*

**14. Are you prepared to bear the demand risk and would you be prepared to take part in on equity when the return depends on demand risk**

*Aktor: we have proved that we can bear this risk and we are willing to do so in future projects.*

*Terna: this is a risk that we are prepared to bear although in the concessions underway profits in excess of the projections will be shared with the public sector while on the other hand some form of subsidy will take place in case profits fall below a minimum level.*

*Themeliodomi: again this is a risk that we are willing to take.*

**15. Would you be prepared to take part in on equity that's not liquid for many years (concession period)**

*Aktor: we are prepared to bear this risk and commit our equity for such a lengthy period of time.*

*Terna: we appreciate those projects as a new kind of long term investment and it should be faced like this.*

*Themeliodomi: we are prepared to do so.*



**16. How do you assess the issue that in an SPV the contractor becomes client of the SPV (no opportunity for claims) and how can you make sure that the contractor does not become dominant of the SPV. How would you deal with the issue of the parent company having two different organizations: the contractor and the equity participation in the SPV with conflicting interests**

*Aktor: this is an issue we have already faced in the car parks and we have decided from this point onwards to deal our participation in various concessions as independent companies even if it means that the contractor experiences reduced profits. We consider concessions as a core activity of our group and we are going to assist in every way in order to strengthen and support it. A main reason for these problems is that the culture and attitudes of contractors is based on the previous and traditional way of bidding and concession practice has not yet been implemented totally. As a group we are interested that both the contracting and the concessionaire part grow and are successful. The way achieve this is by separating these two activities and make them independent. We experienced this when Vinci Construction and Vinci Concession disagreed on various matters on the car parks and acted as independent companies.*

*Terna: the interests are indeed conflicting and throughout the international experience we believe that these two participations should be dealt as two different companies and this is the way we are willing to deal with this issue within our group.*

*Themeliodomi: this is an issue that we have not yet experienced but we believe that the only way to deal with it would be to separate each firm of the group and deal with them as two completely separate companies.*

**17. Are you prepared to co-ordinate with the designer in order to reach a more efficient solution in terms of build ability and how can you reach such goals**

*Aktor: we are willing to collaborate closely with the designer in order to achieve more efficient solutions. Although the people involved in such projects must change their culture and understand the necessities and differences of concession projects in comparison with traditional projects.*

*Terna: we are willing to co-ordinate with consultants and have already collaborated closely with many of them.*

*Themeliodomi: we are indeed prepared to accept any innovative solution that will guarantee better more economic results.*

**18. What is your understanding of whole life cycle cost in a road project**

*Aktor: due to the fact that the contractor is also the operator the only way is to address and implement the issue of life cycle cost in contrast with what was happening in the past in the traditional way. Our participation in the car parks was a specific step ahead into implementing life cycle cost. Gaining experience in various projects is enabling the contractor to understand and implement life cycle cost in a better manner.*

*Terna: this is major issue in any concession project. We deal with this issue in the framework of dealing with these projects as a long term investment*

*Themeliodomi: life cycle cost is very important in these projects and we are determined to address it in close collaboration with the consultant.*

**19. Do you think there are improvements in pavement or other technology available but not yet used in Greece and are you willing to invest in such technology in order to achieve a better cost-benefit performance in future projects**

*Aktor: there are improvements but the implementation of new technologies and change of technical specifications is difficult in Greece due to the culture*

*of the public sector. The issue of setting output specifications and controlling them has not yet been understood by the Public Sector due to their culture and their disbelief of the new method. This leads to a difficulty in implementing technological innovations that have been already in use in other countries. For example French and Spanish firms have successfully implemented new and more efficient pavement types in various projects. This contemplation to old practices and specifications affects negatively both the life cycle cost of the project and the concessionaire's performance.*

*Terna: the issue of investing in such new technologies is not an option yet. Provided that we succeed in bids for concession projects we could address this issue. However, from the existing technologies that are not yet introduced in Greece we are more than willing to implement them. In most of these bids Greek firms participate with foreign firms. Our group participates in joint bids with Spanish firms and if a new method or technology is proposed and proves more efficient by them we are willing to consider it and implement it.*

*Themeliiodomi: there are such improvements and we are trying to follow them by entering joint ventures with foreign more advanced technologically firms.*

<p><b>20. How do you appraise domestic competition and foreign competition (especially French and Spanish firms)</b></p>
--

*Aktor: we are one of the leading firms and as mentioned above we can match both Spanish and French firms with the latter being more successful in their presence in Greece.*

*Terna: we consider foreign firms French, Spanish and German as very competitive but we feel confident that we can match their expertise. We collaborate closely mainly with Spanish firms and participate in joint bids with them.*

*Themeliodomi: French firms have established presence in Greece but in joint ventures with domestic firms.*

**21. Are you in possession of investment competencies in order to make better use of the steady cash flows that result from the participation in the operating scheme of the project**

*Aktor: we have not yet such a dedicated investment department and there is not such a need due to the small number of the projects so far and their small yield. In the future in case we succeed in winning more concession projects this might be an issue that we could address.*

*Terna: currently we have not got such in-house capability.*

*Themeliodomi: no, we have not yet got such a capability.*

<b>APPENDIX B</b>
-------------------

## **BRITISH CONSULTANTS**

Hirst (1996) examines, by the form of a SWOT analysis, the strengths and weaknesses of British consultants in relation to a major transport PFI project such as the Channel Tunnel Rail Link (CTRL). Strengths are often confused for things done well, but many competitors may do those things well too. Has a tendency on focusing on internal factors undertaking insufficient market research on the external factors (Smythe, 2005).

### **Ove Arup**

**Strengths**

Specialist engineering skills  
Highway design  
Creative - Innovative  
Size of organization  
Confident  
Reputation  
Experience

**Weaknesses**

Size of equity  
'Nationalistic' firm structure

### **Halcrow**

**Strengths**

Specialist engineering skills (tunnelling)  
UK transport issues  
Reputation  
Experience  
Contacts  
Skills  
Size of organization

**Weaknesses**

Size of project

The distinctive roles a consulting firm can adopt within a BOOT or PFI project are mentioned below, using the example of a major British consulting firm Halcrow (Baxter, 1997).

### **Halcrow – Designer (non-equity partner) for a concession company**

#### **Strengths**

UK transport issues

Strong reputation with PFI projects

Experience (product design, contract documents, site supervision)

Flexible

Size of organization

Contacts - Strategic links with contractors involved in PFI (Bechtel)

#### **Weaknesses**

Weakness in design project management for major projects and staff communication skills

Members of staff have not adapted to their new role within the PFI context

#### **Opportunities**

Major role in terms of volume of design work

Tendency for higher fee mark-ups than working for the public sector

Ability to work in joint ventures with contractors, operators and occasionally competitors. Particularly important now that construction clients are looking for partnerships

PFI provides more scope for innovation than is typically available within traditional contracting

Potential for developing further strategic alliances with concessionaire groups and their partners

#### **Threats**

If the company is working on a success fee basis it might not be paid if the consortium does not win the bid

Because the company is not a share holder in the concession company it has little power within the project and has no influence on the concessionaire's strategic decisions

PFI potentially encourages foreign consultants to enter the UK market

Prolonged involvement with one concessionaire could compromise other potential clients' view of the company's independence

## **Halcrow – Designer (equity partner) for a concession company**

### **Strengths**

Although Halcrow would not normally seek to contribute equity, this being outside its culture, it has sufficient financial strength to be able to provide unpaid staff time as sweated equity or a limited amount of financial equity on an occasional basis

### **Reputation for asset design within PFI**

The Halcrow Group can demonstrate its credibility to provide useful input to concessionaire strategy meetings

Managerial strength to identify potentially successful projects and be able to take a high degree of risk at bid stage and beyond

### **Weaknesses**

The company has insufficient resources to be able to provide equity for some projects

### **Opportunities**

Equity buys the company a seat on the concession group board meetings and secures the company's position within the group

Growth of equity value and income from dividends could well be substantial

Repeat work is generated if the concessionaire goes on to win further concession projects

### **Threats**

The company is exposed to high risk because: it donates equity which is lost if the consortium is not appointed, the full extent of the equity may not be known until after the concession is awarded and the company is a shareholder in a scheme which could potentially lose money over a long period of time

Since the company is not in the business of taking financial risks when it does choose to contribute equity this impacts strain on the company and its managers

## **Halcrow – Designer technical advisor to the concession company**

### **Strengths**

Reputation in product design and transportation traffic forecasting within PFI

Larges staff base

Strategic links have been built up with

### **Weaknesses**

Perception of clients that the company and its competitors are generally similar which usually results in a price competition

It is usually time lengthy for staff to adopt to the new role within PFI

companies who have a major involvement in PFI

**Lower fee rates than financial advisors and merchant banks**

### **Opportunities**

Fee rates are higher than those typically earned working for the public sector

**The likelihood of winning repeat business is high and grows as the consultant builds more trust with the client**

Opportunity to establish a niche market since this is a new role created by PFI

### **Threats**

The company's reputation could be damaged if its advice turns out to be wrong

Not being an equity partner results in the company being kept at arms length from the main decision making process

Prolonged involvement with one concessionaire could compromise other potential clients' view of the company's independence

## **Halcrow – Technical advisor to Financier**

### **Strengths**

Technical and business credibility within PFI

**Large staff base including project finance specialists**

Lower fee rates than financial advisors and merchant banks

### **Weaknesses**

The company can not afford to maintain very small teams of non core staff such as project finance specialists which restricts the depth of the service it can deliver

Perception of clients that the company and its competitors are generally similar

Poor communication skills when conversing with financiers

### **Opportunities**

Fee rates are usually higher than those typically earned working for the public sector

The likelihood of winning repeat business is high

**Opportunity to establish a niche market  
Widens company's client base**

### **Threats**

The needs of the financier client are different than the public sector client that the company is used working with

The company's reputation could be ruined if its advice turns out to be wrong



**Halcrow – Independent auditor/arbiter****Strengths**

Reputation for product design

Large staff base

Strategic links with other companies

**Weaknesses**

The company encounters difficulty in times in providing key personnel

**Opportunities**

Strengthens company's range of experience in PFI

Opportunity to learn from product and process innovation introduced by the concessionaire

**Threats**

Potential conflicts of interest are invoked by accepting this role